

# JOURNAL

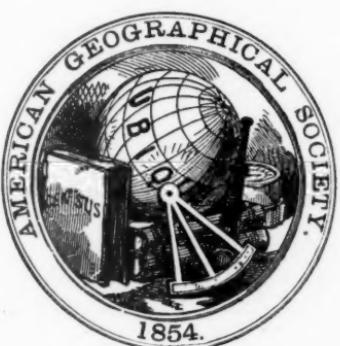
OF THE

# American Geographical Society

OF

NEW YORK.

M.DCCC.LXXXI.



VOL. XIII.

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NEW YORK:  
PRINTED FOR THE SOCIETY.



# AMERICAN GEOGRAPHICAL SOCIETY.

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## OFFICERS AND COUNCILORS, 1881.

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### OFFICERS :

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V



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# CHARTER OF INCORPORATION.

GRANTED APRIL 13TH, 1854.

*The People of the State of New York, represented in Senate and Assembly, do enact as follows:*

SECTION 1. George Bancroft, Henry Grinnell, Francis L. Hawks, John C. Zimmerman, Archibald Russell, Joshua Leavitt, William C. H. Waddell, Ridley Watts, S. De Witt Bloodgood, M. Dudley Bean, Hiram Barney, Alexander J. Cotheal, Luther B. Wyman, John Jay, J. Calvin Smith, Henry V. Poor, Cambridge Livingston, Edmund Blunt, Alexander W. Bradford, and their associates, who are now or may become hereafter associated for the purposes of this act, are hereby constituted a body corporate by the name of The American Geographical and Statistical Society, for the purpose of collecting and diffusing geographical and statistical information.

§ 2. For the purposes aforesaid, the said Society shall possess the general powers and privileges, and be subject to the general liabilities, contained in the third title of the eighteenth chapter of the first part of the Revised Statutes, so far as the same may be applicable, and may not have been modified or repealed; but the real and personal estate which the said Society shall be authorized to take, hold and convey, over and above its library, and maps, charts, instruments and collections, shall not at any time exceed an amount the clear yearly income of which shall be ten thousand dollars.

§ 3. The officers of said Society shall be a president, three vice-presidents, a corresponding secretary, a recording secretary, a librarian, and treasurer, and such other officers as may from time to time be provided for by the by-laws of the said Society.

§ 4. The said Society, for fixing the terms of admission of its members, for the government of the same, for changing and altering

the officers above named, and for the general regulation and management of its transactions and affairs, shall have power to form a code of by-laws, not inconsistent with the laws of this State, or of the United States; which code, when formed and adopted at a regular meeting, shall, until modified or rescinded, be equally binding as this act upon the said Society, its officers, and its members.

5. The Legislature may, at any time, alter or repeal this act.
6. This act to take effect immediately.

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STATE OF NEW YORK, }  
Secretary's Office, }  
ss.:

I have compared the preceding with the original law on file in this office, and hereby certify the same to be a correct transcript therefrom, and of the whole of said original law.

Given under my hand and seal of office, at the city of Albany, this [L. S.] thirteenth day of April, one thousand eight hundred and fifty-four.

A. G. JOHNSON,  
*Deputy Secretary of State.*

# AMENDED CHARTER.

PASSED APRIL 8TH, 1871.

STATE OF NEW YORK, NO. 237, IN SENATE, *March 7, 1871.*—Introduced with unanimous consent, by Mr. Bradley; read twice, and referred to the Committee on Literature; reported favorably from said committee, and committed to the Committee of the Whole.

CHAP. 373.

AN ACT in relation to The American Geographical and Statistical Society.

PASSED April 8th, 1871.

*The People of the State of New York, represented in Senate and Assembly, do enact as follows:*

SECTION 1. The name or corporate title of the said Society shall hereafter be The American Geographical Society of New York.

§ 2. The object of the said Society shall be the advancement of geographical science; the collection, classification, and scientific arrangement of statistics, and their results; the encouragement of explorations for the more thorough knowledge of all parts of the North American continent, and of other parts of the world which may be imperfectly known; the collection and diffusion of geographical, statistical and scientific knowledge, by lectures, printed publications, or other means; the keeping up of a correspondence with scientific and learned societies in every part of the world, for the collection and diffusion of information, and the interchange of books, charts, maps, public reports, documents and valuable publications; the permanent establishment in the city of New York of an institution in which shall be collected, classified and arranged, geographical and scientific works, voyages and travels, maps, charts,

globes, instruments, documents, manuscripts, prints, engravings, or whatever else may be useful or necessary for supplying full, accurate and reliable information in respect to every part of the globe, or explanatory of its geography, physical and descriptive; and its geological history, giving its climatology, its productions, animal, vegetable and mineral; its exploration, navigation and commerce; having especial reference to that kind of information which should be collected, preserved, and be at all times accessible for public uses in a great maritime and commercial city.

§ 3. The power given by the act hereby accorded to the said Society, to take, hold, convey, manage and make use of its real and personal estate, shall be understood as authorizing said Society to take and hold by gift, grant, bequest, devise, subject to all provisions of law relative to devises and bequests by last will and testament, or purchase real estate to the value of three hundred thousand dollars, and to invest its income, or its personal estate generally, so as to produce a regular annual income sufficient for the accomplishment of the purposes set forth in the first section of this act; but said annual income shall not exceed twenty-five thousand dollars annually.

§ 4. The said Society shall make an annual report of its proceedings to the Legislature.

---

STATE OF NEW YORK, } ss. :  
*Office of Secretary of State,* }

I have compared the preceding with the original law on file in this office, and do hereby certify that the same is a correct transcript therefrom, and of the whole of said original law.

Given under my hand and seal of office, at the City of Albany, this twenty-[L. S.] second day of May, in the year one thousand eight hundred and seventy-one.

DIEDRICH WILLERS, JR.,  
*Deputy Secretary of State.*

# BY-LAWS.

## CHAPTER I.

### TITLE.

The title of the Society is, "The American Geographical Society."

## CHAPTER II.

### OBJECTS.

The objects of the Society are, "The collecting and diffusing of geographical and statistical information."

## CHAPTER III.

### MEMBERS.

1. The Society shall consist of Fellows, Honorary, Corresponding and *ex-officio* members.
2. Honorary members shall be chosen on account of their distinction in the science of geography or statistics, and not more than twelve of them shall hereafter be elected in any one year.
3. Corresponding members shall be chosen from those who have aided the advancement of geography or statistics.
4. *Ex-officio* members shall be foreign diplomatic representatives and consuls resident in the United States ; and United States diplomatic representatives and consuls in foreign countries.
5. Fellows and corresponding and honorary members shall be elected as follows : All nominations of candidates shall be openly made in writing at a meeting of the Society, or the Council, by a member thereof, and, together with the name of the member making them, entered on the minutes. The persons thus nominated, when approved by the Council and elected by the Society, shall, on payment of the initiation fee, if nominated as fellows, and without such payment if nominated as corresponding or honorary members, become members of the Society accordingly.

6. Persons entitled to become *ex-officio* members of the Society shall, on the recommendation of the Council, be by the Society constituted and declared to be such members.

7. The name of any member of the Society may, on the recommendation of the Council, and by a vote of two-thirds of the members present at a stated meeting of the Society, be dropped from the roll of its members.

## CHAPTER IV.

### INITIATION FEE AND ANNUAL DUES.

1. The initiation fee, including the dues for the current year, shall be, for a Fellow, ten dollars, to be paid immediately on election.

2. The annual dues thereafter shall be, for a Fellow, ten dollars, to be paid in advance.

3. Any Fellow of the Society, not in arrears, may commute for life all dues for fellowship by the payment at one time, if a Fellow, of one hundred dollars.

4. The name of any Fellow of the Society neglecting for two successive years to pay his annual dues, or at any time wholly refusing to pay them, may by the Council be erased from the list of Fellows of the Society.

5. The fiscal year of the Society shall, for all purposes, be the calendar year; that is, commence on the first day of January, and end with the 31st day of December in each year.

## CHAPTER V.

### OFFICERS.

1. The officers of the Society shall be a president, three vice-presidents, a foreign corresponding secretary, a domestic corresponding secretary, a recording secretary, a treasurer, and fifteen councilors; and these, together, shall form the Council of the Society.

2. The officers and members of Council elected at the next annual election (except the president and treasurer) shall, at their first meeting, divide themselves into three classes, each to embrace

one vice-president, one secretary, and five members of the Council ; one of which classes shall hold office one year, one for two years, and another for three years, to be determined at said meeting by lot or otherwise. The president and treasurer shall always be elected annually ; and at each annual election thereafter there shall be elected a vice-president, secretary and five members of Council, each for the term of three years.

3. All officers of the Society to be chosen at any election may be voted for on one ballot.

## CHAPTER VI.

### ANNUAL MEETING.

1. The annual meeting of the Society shall be held on the second Tuesday after the first day of January in each and every year hereafter, when the annual election of the officers of the Society shall take place ; and if, from any cause, there shall be a failure of the annual election at the time above designated for that purpose, the same may be held on the Tuesday next following—that is, on the third Tuesday after the first day of January in each year—and of which due notice shall be given.

2. Every member of the Society, who has been such for twenty days or more, and who is not in arrears for his dues for the past year, shall be entitled to vote at the said election.

3. At the annual meeting of the Society the Council shall present a general report of its proceedings and of those of the Society during the past year, and the secretaries and treasurer shall also present their annual reports.

## CHAPTER VII.

### MONTHLY AND SPECIAL MEETINGS.

1. The Society, unless otherwise specially ordered by the Society or the Council, shall hold its stated meetings for the transaction of business on the second Tuesday of each month of the year, except July, August and September.

2. The president, or, in his absence, one of the vice-presidents, may, and upon the written request of five members, shall, call a

special meeting of the Society by giving three days' notice thereof in two daily newspapers published in the City of New York.

## CHAPTER VIII.

### ORDER OF BUSINESS.

1. At all stated meetings of the Society for the transaction of ordinary business the order of proceedings shall be as follows :

1. Reading of the Minutes.
2. Reports and Communications from officers of the Society.
3. Reports from the Council.
4. Reports from Committees.
5. Nominations of Members.
6. Special Orders.
7. Unfinished Business.
8. Miscellaneous Business.
9. Papers read and addresses delivered before the Society.

2. All propositions presented for the action of the Society at any of its meetings shall be in writing, when requested by the presiding officer or any member. A proposition thus presented, when seconded and the question thereon stated from the chair, shall be deemed to be in the possession of the Society and open for discussion, but may be withdrawn by the mover at any time before amendment or decision.

3. No member shall speak more than once upon the same question until all the other members present desiring to speak shall have spoken, nor more than twice on any question without leave of the Society.

## CHAPTER IX.

### QUORUM.

At all meetings of the Society nine members present shall constitute a quorum for the transaction of business.

## CHAPTER X.

### COMMITTEES.

All committees authorized by the Society shall, unless otherwise specially ordered, consist of three members each, and be appointed by the presiding officer.

## CHAPTER XI.

### PRESIDING OFFICER.

At all meetings of the Society, on the arrival of the appointed hour and the presence of a quorum, the president, or in his absence one of the vice-presidents, or in the absence of both a chairman *pro tem.*, shall immediately take the chair, call the meeting to order and preside. He shall have only a casting vote. He shall preserve order and decide all questions of order, subject to an appeal to the Society. He shall also, unless otherwise specially ordered, appoint all committees authorized by the Society; and at every annual election, before the opening of the polls, he shall appoint two tellers of the election.

## CHAPTER XII.

### SECRETARIES.

1. Foreign Corresponding Secretary.—It shall be the duty of the foreign corresponding secretary to conduct the general correspondence of the Society with individuals and associate bodies in foreign countries.

2. Domestic Corresponding Secretary.—It shall be the duty of the domestic corresponding secretary to conduct the Society's general correspondence with individuals and associate bodies in the United States.

3. Both the foreign and domestic secretaries shall keep in suitable books to be provided for that purpose, at the Society's rooms, true copies of all letters written by them respectively on behalf of the Society; and shall preserve, on proper files, at the said rooms, all letters received by them on the same account; and at each stated meeting of the Society or the Council, they shall respectively report their correspondence, and read the same, or such parts thereof as may be required.

4. In case of vacancy in the office of either of the corresponding secretaries, or in the absence or disability of either of these officers, the duties of both may be performed by the other corresponding secretary.

5. The Society may designate a particular officer, or appoint a committee to prepare a letter or letters on any special occasion.

6. Recording Secretary.—It shall be the duty of the recording

secretary to give due notice of the time and place of all meetings of the Society, and to attend the same. He shall keep fair and accurate minutes of the proceedings of the Society, and record the same, when approved, in the Society's Journal. He shall give immediate notice to the several officers and committees of the Society, of all votes, orders, resolves and proceedings of the Society affecting them or appertaining to their respective duties. He shall prepare a list of the members of the Society entitled to vote, to be handed to the tellers before the opening of the polls at each annual election. He shall officially sign and affix the corporate seal of the Society to all diplomas and other instruments or documents aauthorized by the Society or Council. He shall have charge of the corporate seal, charter, by-laws, records and general archives of the Society, except so far as they may be expressly placed under the charge of others. He shall certify all actsand proceedings of the Society, and shall notify the Council of the death, resignation or removal of any officer or member of the Society. He shall have charge of the rooms of the Society, and shall perform all such other and further duties as may from time to time be devolved upon him by the Society or the Council. He, together with the Council, shall have the charge and arrangement of the books, maps and collections belonging to the Society. He shall cause to be kept in the rooms of the Society a registry of all donations to the library or collections of the Society, acknowledge their receipt by letter to the donors, and report the same in writing to the Society at its next stated meeting.

7. All documents relating to the Society and under the charge of the secretaries respectively, shall be placed in such depositories in the rooms of the Society as the Council may provide and designate for that purpose.

### CHAPTER XIII.

#### TREASURER.

The Treasurer shall have charge of and safely keep all contracts, certificates of stock, securities and muniments of title belonging to the Society. He shall collect the dues and keep the funds of the Society, and disburse the same under the direction of the Council; and so often as the said funds in the hands of the treasurer shall amount to one hundred dollars, he shall deposit the same, in the

name of the Society, in some incorporated bank in the city of New York, to be designated for that purpose by the Council ; and the said funds, thus deposited, shall be drawn out of the said bank on the check of the treasurer, countersigned by the chairman of the Council, and only for the legitimate and authorized purposes of the Society. The treasurer shall, previous to the annual meeting of the Society, prepare and submit to the Council, for audit, a detailed account of his receipts and disbursements for account of the Society during the past year ; and which annual account, duly audited, he shall present, with his general report, to the Society at its annual meeting.

#### CHAPTER XIV. \*

##### COUNCIL.

1. The Council shall have the management and control of the affairs, property and funds of the Society, and shall designate an incorporated bank in the city of New York, where the said funds shall, from time to time as they accrue, be deposited by the treasurer.
2. It may frame its own by-laws, not inconsistent with the charter or by-laws of the Society.
3. It shall appoint the necessary agents, clerks and servants of the Society, with such powers and duties, privileges and compensation as it may from time to time determine ; and may at pleasure revoke such appointments, and make others in their stead.
4. It shall have power to fill, for the unexpired term, any vacancy that may occur in any of the offices of the Society.
5. It shall have power, at its discretion, to declare vacant the seat of any member of its own body (except the president and vice-presidents) who shall have been absent from its meetings for three successive months ; and also by a vote of a majority of the whole Council to remove from its own body any member thereof for cause ; but in such case it shall be the duty of the Council to report every such vacancy or removal to the Society, at its next stated meeting thereafter, when such cases shall be subject to review by the Society.
6. It shall not, without an approving vote of the Society, at a stated meeting thereof, make any contract whereby a liability in

amount above one thousand dollars may be incurred by the Society ; nor without such vote make any sale or disposition of the property of the Society exceeding that sum in value.

7. The Council may, in its discretion, remit the initiation fee or annual dues of any member of the Society.

8. No member of the Council shall receive any salary or pecuniary compensation for his services.

9. The Counsel shall hold stated meetings for the transaction of business at least once in every month, except the months of July, August and September.

10. At all meetings of the Council, five members present shall constitute a quorum for the transaction of business.

## CHAPTER XV.

### GENERAL PROVISION AS TO DEBT.

No debt on account of the Society, beyond the funds in the treasury for its payment, shall for any purpose, at any time, be incurred ; and if at any time it shall appear that there are resting upon the Society pecuniary obligations beyond the funds in the treasury for their liquidation, no appropriation of funds from the treasury whatever, except for the necessary current expenses of the Society, shall be made, until the said pecuniary obligation shall be fully discharged, or the funds necessary for their extinction shall have been set apart for that purpose.

## CHAPTER XVI.

### ALTERATION OF THE BY-LAWS.

No alteration in the by-laws of the Society shall be made unless openly proposed at a stated meeting of the Society, entered on the minutes, with the name of the member proposing the same, and adopted by the Society at a subsequent meeting, by a vote of two-thirds of the members present.

## CHAPTER XVII.

### ADOPTION OF THE BY-LAWS.

The foregoing are hereby adopted and declared to be the by-laws of the Society ; and all by-laws of the Society heretofore adopted are hereby rescinded and declared to be null and void.

## HONORARY AND CORRESPONDING MEMBERS AND FELLOWS.

---

### HONORARY MEMBERS.

H. I. M. DOM PEDRO, Emperor of Brazil.  
CONSTANTINE, H. I. H., the Grand Duke, President of the Imperial Russian Geographical Society, St. Petersburg.  
DUFFERIN, Right Honorable Frederick Temple Hamilton, Blackwood, Earl of, K.P., G.C.M.G., K.C.B., F.R.S., London, England.  
ELDER, Sir Thomas, Adelaide, South Australia.  
ISMAY PACHA, H. H., ex-Khedive of Egypt, Cairo.  
LAYARD, Austin Henry, D.C.L., London, England.  
BAKER, Sir Samuel White, Pasha, F.R.S., F.R.G.S., London, England.

MARKHAM, Clements R., K.C.B., Secretary Royal Geographical Society, London, England.  
MCCLINTOCK, Sir Admiral Francis Leopold, LL.D., London, England.  
MIDDENDORFF, Adolph Theodore von, Secretary of the Imperial Academy of Sciences of Russia, St. Petersburg.  
NARES, Sir George S., R.N., K.C.B., London, England.  
NORDENSKJÖLD, Prof. A. E., Sweden.  
RAWLINSON, Major-General Sir Henry C., K.C.B., Vice-President Royal Geographical Society, London.  
STRUVE, Professor Otto Wilhelm von, St. Petersburg.  
WILCZEK, Count H., Vienna.

### CORRESPONDING MEMBERS.

ASBJORSEN, P.C., Christiania, Sweden.  
ABBE, Prof. Cleveland, Washington, D. C.  
ALVORD, General Benjamin, U. S. Army, Washington, D. C.  
ARSENIEV, Georges, St. Petersburg.  
ALTAMIRANO, Señor Don Ignacio, Mexico.  
AMMEN, Rear-Admiral Daniel, U. S. Navy, Washington, D. C.  
BAFOUR, David M., Boston, Mass.  
BAKER, Commodore F. H., U. S. Navy, Norfolk, Va.

BARANDA, Señor Joaquim, Mexico.  
BASARAFF, Ed. Ivon de, Stuttgart, Württemberg.  
BARCLAY, James T., M.D., Jerusalem, Syria.  
BARNARD, Henry, LL.D., Hartford, Conn.  
BARTLETT, John Russell, Providence, R. I.  
BLACKIE, Walter G., Ph.D., F.R.G.S., Glasgow.  
BOTASSI, Demetrius, Consul-General of Greece, New York.  
BASTIAN, Dr. Adolph, Berlin.

BECKER, Prof. M.A., Vienna.  
 BEHM, Doctor E., Gotha.  
 BRAINE, Capt. D. L., U.S.N., Washington, D. C.  
 BREWER, Prof. Wm. H., New Haven, Conn.  
 BRIGHT, John, M.P., London.  
 BUSHNELL, Rev. Albert, Gaboon, Equatorial Africa.  
 CHAIX, Prof., Paul, Geneva.  
 CHANDELLES, W., F.R.G.S., London.  
 CHAMBERS, William, LL.D., Edinburgh, Scotland.  
 DRAPER, Lyman, Madison, Wis.  
 DO CANTO, Dr. Ernesto, St. Michaels', Azores.  
 FRITSCH, Hugo O., New York.  
 GARDINER, Prof. James T., Director, State Survey, Albany, N. Y.  
 GILMAN, Prof. Daniel Coit, LL.D., Baltimore, Md.  
 GUYOT, Prof. Arnold Henry, LL.D., Princeton, N. J.  
 HAGUE, J. D., New York.  
 HANCOCK, Prof. Wm. Neilson, LL.D., Dublin.  
 HAYDEN, Prof. F. V., Washington, D. C.  
 HOTCHKISS, Maj. Fred., Staunton, Va.  
 HITCHCOCK, Prof. C. H., Ph. D., Hanover, N. H.  
 HOCHSTETTER, Dr. Ferdinand von, Vienna.  
 HOSMER, Dr. George, New York.  
 HOUGH, Franklin B., M.D., Washington, D. C.  
 HUMPHREYS, General A. A., U. S. Army, Washington, D. C.  
 HUNT, Prof. T. Sterry, LL.D., Boston.  
 JOHNSTON, W. E., M.D., Paris.  
 JACKSON, John P., Berlin.  
 LACROZE, Julius, C.E., Buenos Ayres.  
 LAMANSKY, Eugene von, St. Petersburg.  
 LESSEPS, Ferdinand de, Suez, Egypt.  
 LEFROY, General Sir John Henry, B.A., London, England.  
 LUCE, Capt. S. B., U. S. Navy, Newport, R. I.  
 LONG, Col. C. Chaillé, Cairo, Egypt.  
 MCCARTEE, Divie Bethune, M.D., Summit, N. J.  
 MALTE-BRUN, V. A., Hon. Secretary of the Geographical Society, Paris.  
 MARISCAL, Señor Don Ignacio, Mexico.  
 MARSH, Hon. Geo. P., LL.D., Rome.  
 MARTIN, Rev. Wm. A. P., President Imperial College, Pekin, China.  
 MAURY, Louis Ferdinand Alfred, Paris.  
 MAUNOIR, Charles, Paris.  
 MELLO, Dr. T. G. M., Rio Janeiro.  
 MORGAN, Henry Jas., Ottawa, Canada.  
 NAPRSTEK, Vojta, Prague, Austria.  
 NASSAU, Rev. R. H., Gaboon, Equatorial Africa.  
 NEGRI, Cristoforo, Turin, Italy.  
 NEWMARCH, William, Honorary Secretary Statistical Society of London.  
 ORTIZ, Señor Don Angel D., Seville, Spain.  
 PASSMORE, Frank B., C.E., New Zealand.  
 PACKARD, Prof. A. S., Jr., Providence, R. I.  
 PACHA, Ismail, Governor-General of the Soudan.  
 POESCHE, Theodore, Washington, D.C.  
 PARALTA, Señor Don Manuel M., London.  
 PUMPELLY, Prof. R., Newport, R. I.  
 RETIRO, Viscount Bom., President Historical and Geographical Society, Rio Janeiro.  
 RIMONDI, Don Antonio, Peru.  
 RAE, John M.D., London, England.  
 RAYMOND, Capt. Charles W., U. S. Army, West Point, N. Y.  
 ROMERO, Mathias, Mexico.  
 ROTHRICK, J. T., M.D., Wilkesbarre, Pa.

ROHLFS, Gerhard, M.D., Africa.  
 SEQURO, Viscount Porto, Minister of Brazil at Vienna.  
 STONE, Gen. Chas. P., Cairo, Egypt.  
 SAINT-MARTIN, Vivien de, Paris.  
 SAPUCACHY, M. le Viscomte, Rio Janeiro, Brazil.  
 SCHLAGINTWEIT-SAKÜNLÜNSKI, Robt. von, Geissen, Germany.  
 SCHUMACHER, Herman A., M.D., Consul-General German Empire, New York.  
 SCHUMACHER, John, Altona, Germany.  
 SCHUYLER, Eugene, Bucharest.  
 SELFRIDGE, Com'r T. O., U. S. Navy, Washington, D. C.  
 SEYMOUR, Horatio, LL.D., Utica, N. Y.  
 STANLEY, Henry M., Africa.  
 STARRING, Gen. F. A., Paris.  
 STEVENS, Henry, LL.D., London.  
 STEERE, J. B., Hong-Kong, China.  
 TILLEY, Sir S., Ottawa, Canada.  
 VAN CAMPEN, Sam'l Rich'd, F.R.G.S., C.M.G.S.N., London.  
 WALKER, Gen. Francis A., New Haven, Conn.  
 WALLING, H. F., C. E., Washington, D. C.  
 WHEELER, Capt. G. M., U. S. Army, Washington, D. C.  
 WILLIAMS, S. Wells, LL.D., New Haven, Conn.  
 WRIGHT, Gen. Horatio G., U. S. Army, Washington, D. C.  
 WYMAN, Capt. R. H., U. S. Navy, Washington, D. C.  
 WYSE, Lt.-Com'dr. L. N. B., F.N., Paris, France.  
 YOUNG, Jess, F.R.G.S., Wisbeach, England.

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## FELLOWS.

### CORRECTED TO DECEMBER 31ST, 1881.

Date of Election.	Date of Election.
1859 Arnoux, William H.	1874 Arnold, Richard.
1859 Arnold, David H. (L. F.)	1874 Allen, Henry Wilder.
1859 Aymar, William. (L. F.)	1874 Amy, Henry.
1860 Acton, Thomas C.	1874 Agnew, Alexander McL.
1869 Auchmuty, Richard Tylden.	1874 Astor, W. W. (L. F.)
1871 Atterbury, Rev. Wm. W., D.D.	1874 Appleton, D. S.
1872 Allen, Horatio M.	1874 Anderson, Henry H.
1873 Albert, Halpern.	1874 Alsop, William.
1874 Alexander, Junius B.	1875 Amsinck, Gustav.
1874 Arthur, Gen. Chester A.	1876 Appleton, Nathan.
1874 Aufermann, August.	1878 Austin, Chas. P.
1874 Auchincloss, Henry B.	1879 Austin, William.
1874 Acker, David D.	1879 Aston, Felix.
1874 Avery, Samuel P.	1879 Agostini, Joseph.
1874 Agnew, John T. (L. F.)	1879 Agnew, Cornelius R., M.D.

1879 Ashley, Lucien S.  
 1879 Astor, John Jacob (L. F.)  
 1880 Anthony, James L.  
 1881 Andrews, John R.  
 1881 Abbott, Leon.  
 1881 Allen, Eben S.  
 1881 Armour, Herman O. (L. F.)  
 1881 Andrews, Henry C.  
  
 1852 Bancroft, George. (L. F.)  
 1852 Barney, Hiram. (L. F.)  
 1853 Brown, James M.  
 1853 Butler, Charles.  
 1856 Baker, Francis. (L. F.)  
 1856 Berry, Richard.  
 1856 Brevoort, J. Carson.  
 1859 Brown, James. (L. F.)  
 1859 Boorman, J. Marcus. (L. F.)  
 1859 Bernheimer, Isaac.  
 1859 Belmont, August. (L. F.)  
 1859 Barlow, S. L. M.  
 1861 Butterfield, Gen. Daniel.  
 1865 Vanvard, John. (L. F.)  
 1868 Banks, David.  
 1868 Beckwith, N. M.  
 1868 Bennett, James Gordon.  
 1868 Bernheimer, Adolph.  
 1868 Bernheimer, Simon.  
 1868 Brady, John R.  
 1869 Bailey, Jas. Muhlenberg. (L. F.)  
 1869 Banyer, Goldsboro.  
 1869 Bickmore, Prof. A. S.  
 1869 Bierstadt, Albert.  
 1870 Butler, Cyrus.  
 1870 Botta, Prof. Vincenzo.  
 1870 Body, John E.  
 1870 Bishop, T. Alston. (L. F.)  
 1872 Brown, Walston H.  
 1873 Bailey, N. P.  
 1874 Bishop, D. W. (L. F.)  
 1874 Bien, Julius.  
 1874 Bartlett, Willard.  
 1874 Bissinger, Philip.  
 1874 Backus, Henry C.  
 1874 Ballin, Eugene S.  
 1874 Baldwin, Townsend B.  
  
 1874 Bates, Levi M.  
 1874 Barnes, John S.  
 1874 Barbour, Thomas. (L. F.)  
 1874 Bonner, Robert.  
 1874 Bonn, William B.  
 1874 Barnard, Horace.  
 1874 Barnard, F. A. P., LL.D.  
 1874 Benjamin, John.  
 1874 Butler, Wm. Allen.  
 1874 Bartow, Morey H.  
 1874 Barr, William.  
 1874 Belding, Milo M.  
 1874 Buckley, Rev. Jas. M.  
 1874 Bookstaver, Henry W.  
 1874 Brownson, Lieut. W. H., U. S. N.  
 1875 Barney, Charles T.  
 1875 Beaman, Charles C., Jr.  
 1875 Bernheimer, J. A.  
 1875 Beckwith, Leonard F.  
 1875 Benjamin, E. B.  
 1875 Beekman, Gerard.  
 1875 Babcock, Gen. O. E., U. S. Army.  
 1875 Brownell, Silas B.  
 1875 Burgess, William J.  
 1875 Brown, Vernon H.  
 1875 Barnes, William.  
 1875 Beste, Henry.  
 1875 Bredt, Ernest.  
 1875 Bedle, Joseph D.  
 1875 Belknap, Capt. Geo. E., U. S. N.  
 1875 Bowie, Augustus J., Jr.  
 1876 Banks, James L., M. D.  
 1876 Baldwin, Commodore Charles H.,  
 U. S. N.  
 1876 Brower, John.  
 1876 Billings, Frederick.  
 1876 Bellew, F. H. T.  
 1877 Booth, George.  
 1877 Bixby, Robert F.  
 1877 Börs, Christian.  
 1877 Briggs, Prof. Charles A.  
 1877 Blanchard, George R.  
 1867 Blatchford, Eliphalet W.  
 1878 Bliss, Cornelius N.  
 1878 Brown, G. Melville.  
 1878 Barton, Oliver Grant. (L. F.)

1878 Brown, Rev. Philip A. H.	1874 Church, Col. George E.
1878 Brand, James.	1874 Chistern, F. W.
1878 Brown, J. Romaine.	1874 Cockcroft, Jacob H. V.
1879 Brady, James T.	1874 Chickering, Charles F.
1879 Barattoni, C. A.	1874 Comstock, Cornelius.
1879 Bowen, Gen. Edmund S.	1874 Constable, James M.
1880 Bayard, Edward, M. D.	1874 Ceballos, J. M.
1880 Beach, Miles.	1874 Carter, Walter S.
1880 Bamberger, A. E.	1874 Caswell, Wm. H.
1880 Banks, D. S.	1874 Crerar, John.
1881 Baldwin, Edwin.	1874 Crocker, David.
1881 Babcock, Courtland G.	1874 Cruikshank, Edwin A.
1881 Bartlett, Commander John R. U. S. N.	1874 Crosby, J. Schuyler.
1881 Barber, Charles G.	1874 Coates, Isaac T., M.D.
1881 Brown, Augustus L.	1874 Cochrane, Capt. Henry Clay, U S. M. C.
1881 Baldwin, Christopher C.	1874 Colgate, James B.
1881 Babcock, Samuel D.	1874 Constantine, Andrew J.
1881 Ballin, Frederick E.	1874 Corning, Erastus.
1881 Backus, Henry Landon.	1874 Cottenham, Francis.
1852 Colton, Joseph H. (L. F.)	1874 Cossitt, Frederick H.
1855 Conkling, Frederick A. (L. F.)	1874 Coutan, Charles E.
1855 Cooper, Peter.	1874 Conyngham, Wm. L.
1856 Cooley, James E. (L. F.)	1874 Crosby, Hiram B.
1856 Cooper, Edward.	1874 Crocker, Geo. A.
1856 Crooks, Ramsey. (L. F.)	1874 Crocker, Wm. Baylies.
1863 Cary, William F. (L. F.)	1874 Chickering, George H.
1868 Catlin, N. W. Stuyvesant. (L. F.)	1874 Carter, Oliver S.
1868 Ciseo, John J.	1874 Carhart, Thos. F.
1868 Chapman, Joseph H.	1874 Catlin, Julius, Jr.
1869 Cullum, General George W., U. S. Army. (L. F.)	1874 Colgate, Robert.
1870 Conklin, William A.	1874 Curren, Robert.
1872 Corse, Israel.	1875 Clendenin, J. W.
1872 Conklin, Eugene E.	1875 Cameron, R. W.
1872 Crawford, General S. W., U. S. Army.	1875 Cushman, W. F.
1872 Clark, E. V.	1875 Cooper, George C.
1872 Cox, Samuel S.	1875 Champlin, John D., Jr.
1873 Coster, Charles H.	1875 Cassebeer, Henry A., Jr.
1874 Cruickshank, James, LL.D.	1875 Chittenden, S. B., Jr.
1874 Connery, T. B.	1876 Clarke, W. H.
1874 Cowdrey, N. A.	1876 Cullum, Mrs. George W. (L. F.)
1874 Curphey, James	1876 Constable, Major A. G.
1874 Campbell, Allan.	1876 Cornell, John B.
	1876 Curtis, Benj. L.
	1876 Curtis, Benjamin R.
	1879 Cooper, James G.

1879 Church, Simeon E.	1874 Delafield, M. L.
1879 Coddington, Gilbert S.	1874 Dana, Charles A.
1879 Caldwell, R. A., M.D.	1874 Draper, Frank E.
1879 Childs, George W.	1874 Devlin, Jeremiah.
1880 Calvin, Delano C.	1874 Decker, John J.
1880 Clark, Lester W.	1874 Del Monte, Leonardo.
1880 Chamberlain, J. A.	1874 Du Bois, Wm. A.
1880 Cohen, Maurice S.	1874 De Castro, Diego.
1880 Collins, John C.	1874 Davis, John G.
1880 Cormack, John A.	1874 Dalrymple, Alexander.
1880 Caverley, William.	1874 Dunscomb, Richard T.
1880 Camp, W. A.	1874 Dun, R. G.
1880 Clymer, Edward M.	1874 Defendorf, Wilson.
1880 Cronly, John E.	1875 Darrow, William.
1881 Chaffee, Jerome B.	1875 Davies, Julien T.
1881 Carnochan, J. M., M.D.	1875 Du Bois, Eugene.
1881 Canfield, Charles B.	1875 Daniel, Edwin M.
1881 Clinton, Henry L.	1875 Davidson, Charles A.
1881 Chandler, Nathan.	1875 de Peyster, Frederic J. (L. F.)
1881 Coddington, Thomas B.	1875 Delafield, Lewis L.
1855 Daly, Chief-Justice C. P. (L. F.)	1875 Dommerick, L. F.
1855 Dunshee, Prof. Henry W.	1876 Davis, Gilbert F.
1856 Douglas, Andrew E.	1876 Drexel, Joseph W.
1856 Dodge, Wm. E.	1877 Day, Henry M.
1856 Dodge, Wm. E., Jr.	1877 Davis, Joseph Beale. (L. F.)
1856 Detmold, Wm., M.D.	1878 Dana, Charles.
1859 Dickerson, E. N.	1878 Di Cesnola, Gen. L. B.
1864 Detmold, Christian E.	1879 Dahlgren, Charles B.
1866 Darling, Wm. A.	1879 Dodge, George E.
1868 Dwight, Prof. Theo. W.	1879 Dana, Samuel B.
1868 Du Chaillu, Paul B.	1880 Davis, Theodore M.
1868 Dennis, Charles. (L. F.)	1880 Deane, John H. (L. F.)
1870 Dash, John B.	1880 Dyckman, Isaac M.
1870 Davies, Alexander J. (L. F.)	1880 Du Bois, James G.
1870 Drowne, Henry T.	1880 Du Bois, Frederick N.
1870 Dinsmore, William B	1880 Dash, Bowie.
1871 Daly, Joseph F.	1880 Dunn, John.
1873 De Peyster, Frederick. (L. F.)	1890 Dexter, Henry. (L. F.)
1873 Delano, Franklin H.	1880 Deen, William M.
1874 De Peyster, Gen. J. Watts. (L. F.)	1881 Dean, F. M.
1874 Diefendorf, Menzo.	1881 Davies, H. B.
1874 Davis, Noah.	1881 Docharta, Augustus T. (L. F.)
1874 Dillon, Romaine. (L. F.)	1881 Dowd, William.
1874 Dutilh, E.	1859 Evarts, William M.
1874 Decker, Charles A.	1864 Evans, Walton W.

1868 Emmet, Thomas Addis, M.D.  
1872 Edwards, Jonathan.  
1874 Eaton, Dorman B.  
1874 Eaton, D. Cady.  
1874 Ewen, John, Jr.  
1875 Eldridge, Titus B.  
1875 Esterbrook, Richard, Jr.  
1875 Ellis, John W.  
1875 Elliott, John.  
1875 Eimer, Charles.  
1875 Ely, Richard S.  
1875 Eads, Captain James B., C.E.  
1877 Elderkin, John.  
1878 Eno, John C.  
1878 Ellis, John, M.D.  
1878 Edson, Franklin.  
1879 Earl, Ferdinand P.  
1879 Elliott, Samuel.  
1880 Eckert, Thomas T.  
1881 Ellis, Ralph N.  
1881 Evans, Silas C.  
  
1854 Field, Cyrus W. (L. F.)  
1856 Field, David Dudley.  
1856 Field, B. H. (L. F.)  
1857 Fish, Hamilton.  
1859 Fogg, Wm. H. (L. F.)  
1860 Field, Rev. H. M.  
1864 Faile, Thomas H.  
1868 Frohwein, Theobald.  
1869 Forsyth, Rev. John.  
1871 Fliess, Wm. M.  
1873 Freedman, John J.  
1873 Fithian, Freeman J.  
1874 Farragut, Loyall.  
1874 Foshay, James W.  
1874 Fabbri, Egisto P.  
1874 Fellows, John P.  
1874 Francklyn, C. G.  
1874 Fleet, Oliver S.  
1874 Fatman, Lewis.  
1874 Forman, Alexander.  
1874 Fox, Baldwin N.  
1874 Fougera, Edmund C.  
1874 Fox, Austin G.  
1875 Foulke, Thomas.  
  
1875 Faile, Charles V.  
1875 Fargo, James C.  
1875 Fuller, Charles D.  
1875 Ford, James B.  
1875 Foote, Emerson.  
1875 Folsom, George W.  
1876 Fisk, Gen. Clinton B.  
1877 Fiske, Andrew.  
1877 Flagg, William J.  
1878 Ferris, L. Murray, Jr.  
1879 Fellows, John R.  
1879 Ferris, Robert M.  
1880 French, Stephen B.  
1880 Fairchild, George M., Jr.  
1881 Fleitmann, Ewald.  
1881 Fairbanks, Joseph H.  
1881 Farrington, E. A.  
1881 Fearing, Charles F.  
1881 Foote, Frederick W.  
1881 Fearing, William H.  
  
1856 Greenwood, Isaac J.  
1857 Greene, John W., M.D. (L. F.)  
1859 Griswold, George. (L. F.)  
1860 Graham, James L. (L. F.)  
1868 Gebhard, Wm. H. (L. F.)  
1868 Gerry, Elbridge T. (L. F.)  
1868 Green, Andrew H.  
1868 Greene, Gen. G. S.  
1869 Gilbert, Clinton.  
1872 Gerard, James W.  
1872 Grinnell, R. M. (L. F.)  
1873 Gillmore, Gen. Q. A., U.S.A.  
1873 Gedney, Frederick G.  
1873 Glaubensklee, Theo. G.  
1874 Gardner, Hugh.  
1874 Green, John. (L. F.)  
1874 Gunther, William Henry.  
1874 Gunther, F. F.  
1874 Gibert, Fred. E.  
1874 Gibbs, Theodore K.  
1874 Gottsberger, William S.  
1874 Galpen, Horace.  
1875 Greene, Lieut. F. V., U.S.A.  
1875 Gordon, Robert.  
1875 Greene, G. S., Jr., C.E.

1875 Garrison, Cornelius K.  
 1875 Gibson, James.  
 1875 Goepf, Charles.  
 1876 Gautier, Dudley G.  
 1877 Gaylord, Augustus.  
 1877 Guleke, H. F., M.D.  
 1878 Gillies, James W.  
 1878 Garrison, William R.  
 1879 Graves, Arthur B.  
 1879 Gay, Joseph E.  
 1880 Graeff, Albert I.  
 1880 Gorringe, Lt. Comdr. Henry H.,  
     U. S. N.  
 1880 Gunning, William J.  
 1881 Gallaway, R. M.  
 1881 Gomez, A.  
 1881 Green, George. (L. F.)  
 1881 Giles, John C.  
 1881 Grace, William R. (L. F.)  
 1881 Garland, James A.  
 1881 Gallatin, James.  
 1856 Hewitt, Abram S.  
 1856 Hunt, Wilson G.  
 1858 Holton, David P., M.D. (L. F.)  
 1859 Henderson, John C.  
 1859 Havemeyer, John C. (L. F.)  
 1864 Hammond, Henry B.  
 1868 Huntington, Daniel. (L. F.)  
 1868 Hurlbert, William H.  
 1868 Hoguet, Robert J.  
 1868 Hall, Elial F.  
 1868 Hadden, John A. (L. F.)  
 1868 Hallock, Mrs. Frances.  
 1870 Hawkes, Prof. W. Wright.  
 1870 Havens, Charles G.  
 1870 Harrison, Prof. Thomas F.  
 1871 Hamilton, Alexander, Jr.  
 1871 Hand, Clifford A.  
 1872 Hammersley, John W. (L. F.)  
 1872 Hawkins, Dexter A.  
 1872 Holbrook, Levi.  
 1873 Havemeyer, Theo. A.  
 1874 Hamersley, A. Gordon. (L. F.)  
 1874 Hamersley, Louis C. (L. F.)  
 1874 Hancock, Gen. Winfield S., U.S.A.  
 1874 Hay, John.  
 1874 Hitchcock, Rev. Roswell D., D.D.  
 1874 Havemeyer, Hector C.  
 1874 Hoguet, Henry L.  
 1874 Hoyt, Oliver.  
 1874 Hurlbert, Henry A. (L. F.)  
 1874 Hutton, Benjamin H.  
 1874 Haydock, George G.  
 1874 Haines, John P.  
 1874 Hinton, John H., M.D. (L. F.)  
 1874 Hendricks, M. M.  
 1874 Hawk, Samuel.  
 1874 Havemeyer, James.  
 1874 Holbrook, E. F.  
 1874 Hoe, Richard M.  
 1874 Harper, Nathan.  
 1874 Hunter, Charles F.  
 1874 Hendricks, Edmund.  
 1874 Hendricks, Joshua.  
 1874 Hatch, Rufus.  
 1874 Huntington, C. P. (L. F.)  
 1874 Hunter, Lieut. Edward, U.S.A.  
 1874 Hoyt, Harlow M.  
 1875 Hubbard, Prof. O. P.  
 1875 Hammond, Wm. A., M.D.  
 1875 Houston, Col. D. C., U.S.A.  
 1875 Howell, Maj. Charles W., U.S.A.  
 1875 Hoadley, John C.  
 1875 Hughes, Wm. H. T.  
 1875 Hoppenstedt, G. L.  
 1875 Hanemann, John F.  
 1875 Howland, Meredith.  
 1875 Hyde, Henry B.  
 1875 Harper, P. J. A.  
 1875 Hazen, Gen. W. B., U.S. Army.  
 1875 Harris, Siegmund.  
 1875 Hun, Leonard G.  
 1876 Heminway, Albert G.  
 1876 Holt, Henry.  
 1876 Hallock, Henry W.  
 1876 Halsted, Major Geo. B.  
 1876 Holman, Frank E.  
 1876 Hoes, Wm. M.  
 1876 Hatfield, J. B. T.  
 1877 Houghton, Prof. Walter R.  
 1878 Howe, George S.

1878 Hermann, Henry. (L. F.)  
1878 Hinman, Wm. K.  
1878 Holden, Horace.  
1878 Hitchcock, Hiram.  
1879 Hamilton, William G.  
1879 Harris, Col. Robert.  
1879 Hayes, A. A., Jr.  
1879 Hamilton, Capt. F. B., U.S.A.  
1880 Hall, Hayden H.  
1880 Howard, William Lee.  
1880 Hickox, Charles R.  
1881 Hinman, Russell.  
1881 Henderson, Thomas, Jr.  
1881 Hunt, Rev. M. A., O. M. I.  
1881 Hoffman, Charles B.  
1881 Hamilton, Robert Ray.  
1881 Haven, George Griswold.  
  
1859 Ireland, John B.  
1874 Ives, Fred'k E.  
1874 Iselin, Adrian, Jr.  
1879 Inman, William H.  
1879 Isham, Charles H.  
1881 Ives, Brayton. (L. F.)  
  
1852 Jay, John. (L. F.)  
1852 Jones, John D. (L. F.)  
1868 Johnson, Hezron A.  
1871 Jones, Walter R. T.  
1874 Judson, Wm. D.  
1874 Janssen, Gerhard.  
1874 Jesup, M. K. (L. F.)  
1874 Jaffray, Edward S.  
1874 Jenkins, Wm. L.  
1874 James, D. Willis.  
1874 Jameson, Joseph A.  
1874 Jordan, Conrad N.  
1874 Jones, George.  
1874 Jaffray, Robert.  
1878 Jones, George H.  
1878 Judson, Capt. J. A., C.E.  
1879 Jay, William.  
1880 Jones, Frederick W.  
1880 Jewett, George L.  
1880 Jenkins, Silvanus F.  
1881 Jewett, Hugh J.  
  
1881 Johnson, Bradish, Jr.  
1854 Kennedy, Robert Lenox.  
1869 Kelly, Eugene.  
1870 Kühne, Frederick.  
1872 Kendrick, Col H. L., U. S. Army.  
1873 Kennan, George.  
1874 King, Edward.  
1874 Kearney, Joseph R.  
1874 Kunhardt, Henry R.  
1874 Kingsland, Wm. M. (L. F.)  
1874 Kidder, Henry P. (L. F.)  
1874 Kalbfleisch, Charles H.  
1874 Keck, Thomas.  
1874 Kemp, William  
1874 Knower, John.  
1874 King, David, Jr.  
1875 Knapp, Herman, M. D.  
1876 Knauth, Percival.  
1877 King, Clarence.  
1877 Kane, Gen. Thomas L.  
1878 Kernochan, Jas. Lorillard.  
(L. F.)  
1879 Kane, S. Nicholson.  
1880 Kidder, A. S., M. D.  
1880 Keene, James R. (L. F.)  
1881 Kennedy, John S. (L. F.)  
1881 Kane, Grenville. (L. F.)  
1881 Kirsch, Louis.  
  
1852 Livingston, Cambridge. (L. F.)  
1857 Low, A. A.  
1859 Lathers, Richard. (L. F.)  
1868 Lawrence, Abraham R.  
1869 Lawrence, John S. (L. F.)  
1870 Loew, Frederick W.  
1870 Lyman, Edward H. R.  
1871 Letson, Robert S.  
1871 Larremore, Richard L.  
1871 Lee, Ambrose.  
1872 Libbey, William. (L. F.)  
1874 Lauterbach, Edward.  
1874 Livingston, Robert J. (L. F.)  
1874 Langdon, Walter. (L. F.)  
1874 Lorillard, Peter.  
1874 Lorillard, George L.

1874 Livingston, John A.  
 1874 Livingston, Robert E.  
 1874 Littlejohn, James.  
 1874 Lawton, Walter E.  
 1874 Lawrence, Jos. B.  
 1874 Leggett, Francis W.  
 1874 Le Comte, Joseph.  
 1874 Lewis, Walter H.  
 1874 Lawson, Leonidas M.  
 1874 Lane, George W.  
 1874 Lawrence, Samuel B.  
 1874 Lesher, Stephen R.  
 1875 Low, Seth.  
 1875 Lawrence, George N.  
 1876 Low, A. Augustus.  
 1876 Lindau, Leopold.  
 1877 Lockwood, Le Grand.  
 1877 Latrobe, John H. B.  
 1878 Loubat, J. F., LL.D. (L. F.)  
 1878 Leon, Nestor Ponce de.  
 1879 Levy, Augustus H.  
 1880 Lang, Alexander.  
 1880 Learned, Edward.  
 1880 Lee, William H.  
 1881 Libbey, William, Jr. (L. F.)  
 1881 Langdon, Woodbury G. (L. F.)  
 1881 Little, Joseph J.  
 1881 Livermore, Edwin R.  
 1881 Lee, J. Bowers.  
 1852 Myers, Col. T. Bailey. (L. F.)  
 1853 Moore, George H. (L. F.)  
 1856 Morgan, E. D.  
 1856 Monroe, Ebenezer.  
 1856 Manners, David S.  
 1859 MacMullen, John.  
 1859 Morrell, Wm. H. (L. F.)  
 1859 Moore, Frank. (L. F.)  
 1863 May, Lewis.  
 1863 Moore, W. H. H. (L. F.)  
 1864 Morton, Levi P.  
 1868 Morrison, Henry.  
 1868 Moreau, John B.  
 1868 Martin, Isaac P.  
 1868 Marquand, Henry G.  
 1868 Marsh, Luther R.  
 1868 McClure, George.  
 1869 Moore, Henderson  
 1870 Marbury, Francis F.  
 1870 Murray, D. Colden.  
 1870 Miles, Edward D.  
 1872 Myer, F. William.  
 1872 Matthews, Edward, (L. F.)  
 1872 Marié, Peter. (L. F.)  
 1873 Moore, C. B.  
 1874 Morris, Henry L.  
 1874 Mailler, W. H.  
 1874 Marble, Manton.  
 1874 Morrison, Edward.  
 1874 Morgan, W. F.  
 1874 Miller, Philip S.  
 1874 Moir, James.  
 1874 Morgan, J. Pierpont. (L. F.)  
 1874 Myers, John K.  
 1874 Martin, John M.  
 1874 McAlpine, David H.  
 1874 Merrall, William J.  
 1874 Moulton, Clarence F.  
 1874 Miller, Geo. Macculloch.  
 1875 Mitchell, Edward.  
 1875 Macy, Arthur.  
 1875 Marcus, Arnold.  
 1875 Meyer, Theo. F. H.  
 1875 Mott, Henry A., Jr.  
 1875 Monheimer, Joseph A.  
 1875 Magoun, George C.  
 1875 Maclay, Moses B.  
 1875 Martin, Bradley.  
 1875 Meyer, L. H.  
 1875 McLanahan, Geo. William.  
 1876 Mitchell, W. Howard.  
 1876 Mattson, Morris, M.D.  
 1877 Matsell, George W.  
 1878 Morison, John C.  
 1878 Merrick, William H.  
 1878 Montant, Alphonse.  
 1878 Musgrave, Thomas B. (L. F.)  
 1878 Mason, Lieut. T. B. M., U. S. N. (L. F.)  
 1879 Marshall, William I.  
 1879 Mather, Frederick E.  
 1879 Motz, Ferdinand.  
 1879 Miller, John Bleecker.

1879 Montieth, James.  
1880 Mills, D. O. (L. F.)  
1880 Mason, Thomas D.  
1880 Mackenzie, Lieut. M. R. L., U. S. N.  
1880 Massey, William M.  
1881 McGee, Flavel.  
  
1870 Neilson, William H.  
1873 Neilson, Frederic.  
1874 Newell, John.  
1874 Niles, William W.  
1874 Newcombe, Isaac B.  
1875 Northrop, A. L.  
1880 Nelson, William, Jr.  
  
1874 Ottendorfer, Oswald. (L. F.)  
1874 Osgood, Franklin.  
1874 Olyphant, Robert M.  
1874 Oakley, E. Benedict.  
1874 Owen, Frederick N.  
1875 Otterbourg, Marcus.  
1875 Ottiwell, John D.  
1875 O'Connor, Thomas H.  
1875 Opdyke, William S. (L. F.)  
1876 Olmsted, Fred'k Law.  
1876 Olmstead, Dwight H.  
1877 O'Gorman, Richard.  
1877 Ogden, Isaac C., Jr.  
1878 Osgood, Prof. Howard.  
1879 O'Gorman, Richard, Jr.  
1879 O'Brien, Thomas S.  
1880 O'Shaughnessy, John W. (L. F.)  
1881 Oakley, Henry A.  
  
1852 Prime, Frederick. (L. F.)  
1852 Poor, Henry V. (L. F.)  
1852 Pierrepont, Henry E. (L. F.)  
1855 Pierrepont, Edwards.  
1857 Pyne, Percy R.  
1859 Purser, George H.  
1859 Prime, Fred'k E. (L. F.)  
1860 Phelps, Royal. (L. F.)  
1862 Phillips, George W.  
1868 Powers, William P.  
1868 Paulison, John P.  
1871 Potter, Howard.  
  
1871 Peabody, Charles A.  
1872 Parish, Henry.  
1873 Plum, Elias.  
1874 Parker, Willard, M. D.  
1874 Peake, William I.  
1874 Peabody, Arthur J.  
1874 Penfold, William Hall.  
1874 Phelps, I. N.  
1874 Potter, Orlando B.  
1874 Pondir, John.  
1874 Paris, Sherman.  
1874 Preble, John Q.  
1874 Porter, John K.  
1874 Packer, Elisha A.  
1874 Powers, George J.  
1874 Pellew, Henry E.  
1874 Prichard, William M.  
1875 Prentice, W. P.  
1870 Pope, Gen. John, U. S. Army.  
1875 Pfund, Anton.  
1875 Peipers, Hugo.  
1875 Porter, Gen. Horace.  
1876 Perkins, George W.  
1876 Parsons, Levi.  
1876 Plum, James R.  
1876 Palmer, Gen. W. J.  
1878 Parsons, Edwin.  
1880 Pinchot, James W.  
1880 Powell, Wilson M.  
1881 Post, Charles A.  
  
1854 Rutherford, L. M.  
1856 Randolph, Anson D. F.  
1856 Remsen, William. (L. F.)  
1856 Riker, John H.  
1859 Rapallo, Charles A.  
1859 Reckendorfer, Joseph. (L. F.)  
1861 Rogers, C. B. (L. F.)  
1868 Raven, Anton A.  
1868 Rose, Cornelius.  
1872 Robbins, Chandler. (L. F.)  
1873 Reinhart, B. F. (L. F.)  
1874 Reid, Whitelaw.  
1874 Rives, Francis R.  
1874 Richard, Auguste.  
1874 Rogers, H. Livingston.

1874 Riker, William J.  
 1874 Requa, James M.  
 1874 Reynes, Jaime.  
 1874 Rhoades, John H.  
 1874 Ramsey, Charles G.  
 1874 Ransom, F. A.  
 1874 Rhoades, Lyman.  
 1875 Roosevelt, Clinton.  
 1875 Rives, G. L.  
 1875 Roberts, Nathan B.  
 1875 Read, J. Meredith.  
 1875 Rose, Charles.  
 1875 Rosenfeld, Isaac.  
 1876 Ross, William B.  
 1877 Rose, Theodore.  
 1877 Rice, A. Thorndike.  
 1877 Roome, William P.  
 1878 Roorback, Orville A.  
 1878 Rainey, Thomas, M. D.  
 1879 Redmond, James Morton.  
 1879 Rhinelander, Miss J. (L. F.)  
 1880 Robinson, Mrs. John A. (L. F.)  
 1881 Randolph, J. C. F.  
 1881 Robbins, George A.  
 1881 Rhinelander, Frederick W.  
 1853 Smith, James O., M. D.  
 1854 Sewell, Henry F.  
 1855 Stuart, Robert L.  
 1856 Spofford, Paul N.  
 1856 Schermerhorn, Wm. C.  
 1856 Sherman, W. Watts.  
 1859 Schell, Augustus (L. F.)  
 1859 Schultz, John H. (L. F.)  
 1860 Stout, Francis A. (L. F.)  
 1868 Seward, Clarence A.  
 1868 Shea, George.  
 1869 Savage, John (L. F.)  
 1869 Strebeigh, Robert M.  
 1870 Schell, Richard. (L. F.)  
 1870 Sherwood, John.  
 1870 Schafer, Samuel M.  
 1870 Schafer, Simon.  
 1870 Seligman, James.  
 1870 Seligman, Jesse.  
 1871 Shaler, Gen. Alexander.  
 1871 Swan, William H.  
 1872 Stern, Myer.  
 1872 Stengel, Prof. Frederick.  
 1872 Steiger, E.  
 1872 Stuyvesant, Rutherford. (L. F.)  
 1873 Smith, James M.  
 1873 Slevin, Thomas E.  
 1873 Sturges, Frederick.  
 1873 Spencer, James C.  
 1873 Scott, Julian. (L. F.)  
 1873 Southworth, Alvan S. (L. F.)  
 1873 Sturgis, Frank K. (L. F.)  
 1874 Sands, Harry M.  
 1874 Steinway, William.  
 1874 Storrs, Charles. (L. F.)  
 1874 Sands, Philip J.  
 1874 Smith, Samuel Drake.  
 1874 Sloan, Samuel.  
 1874 Schermerhorn, F. Augustus  
 1874 Stuyvesant, Robert R.  
 1864 Scott, Col. Henry L.  
 1874 Scudder, Henry J.  
 1874 Stuart, Joseph.  
 1874 Stokes, James.  
 1874 Strong, W. L. (L. F.)  
 1874 Steward, D. Jackson.  
 1874 Stevens, Alexander Henry.  
 1874 Sherman, Benjamin B.  
 1874 Shethar, Samuel.  
 1874 Sheafe, J. F.  
 1874 Schieffelin, Samuel B.  
 1874 Stiger, William E.  
 1874 Stillwell, Benjamin M.  
 1874 Sawyer, Warren.  
 1874 Sands, Andrew H.  
 1874 Schaus, William.  
 1874 Simpkins, N. S., Jr.  
 1874 Spinney, Joseph S.  
 1874 Salomon, Edward.  
 1874 Sewell, Robert.  
 1874 Striker, J. A.  
 1875 Stamford, William H.  
 1875 Smith, Lewis Bayard.  
 1875 Smith, Charles Stewart.  
 1875 Stewart, Col. Charles S., U. S. A.  
 1875 Sturges, Henry C.

1875 Schultz, Carl H.  
1875 Sandford, Elliott. (L. F.)  
1875 Stranahan, J. S. T.  
1875 Schofield, Gen. John M., U.S.A.  
1875 Schieffelin, H. Maunsell.  
1875 Sibley, Gen. Henry H., U.S.A.  
1875 Schiff, Jacob H.  
1875 Strazburger, Oscar.  
1875 Schlesinger, Alfred.  
1875 Smith, Apollos.  
1875 Smith, Augustine.  
1876 Smith, Harsen H.  
1876 Sibley, Hiram W.  
1876 Spaulding, Henry F.  
1876 Smith, Dwight, M. D.  
1876 Stryker, Gen. William S.  
1876 Stone, A. B.  
1877 Schuyler, Philip.  
1877 Shearman, William P.  
1877 Sanford, Henry S.  
1877 Sanger, Major Joseph P., U.S.A.  
1877 Schaff, Rev. Philip, D. D.  
1878 Scott, James.  
1878 Stewart, William Rhinelander.  
1878 Sanford, A. Wright.  
1878 Sands, William R.  
1878 Smith, S. Newton.  
1878 Smull, W. P.  
1878 Sabla, Theodore de Joly de.  
1879 Saltus, Edgar Evertson.  
1879 Simion, Leonhard.  
1879 Smith, Herbert H.  
1879 Stone, R. C.  
1879 Speir, Francis, Jr.  
1879 Stevens, Frederick W. (L. F.)  
1879 Smith, E. Reul. (L. F.)  
1879 Shields, Prof. Charles W.  
1879 Stetson, Francis Lynde.  
1879 Squires, Grant.  
1879 Spencer, Mrs. Catherine L. (L. F.)  
1880 Southwick, Henry K.  
1880 Starr, Theodore B.  
1880 Suydam, John R., Jr.  
1880 Smythe, Henry.  
1880 Stark, L. J. N.  
1880 Stokes, George H.  
1880 Savery, Bartlett M.  
1880 Shepherd, Sherringham A.  
1881 Stone, Joseph F.  
1856 Tiffany, Charles L.  
1856 Townsend, Randolph W.  
1859 Tracy, Charles.  
1868 Taylor, Douglas.  
1868 Tilden, Samuel J.  
1870 Tuckerman, Lucius.  
1870 Thomson, James.  
1872 Tower, Gen. Z. B., U. S. Army.  
1874 Thompson, David G. (L. F.)  
1874 Tiemann, Peter C.  
1874 Tefft, Erastus T.  
1874 Thorne, Jonathan.  
1874 Trevor, John B.  
1874 Taylor, Alfred J.  
1874 Thorne, William H.  
1874 Turner, Herbert B.  
1874 Terry, Com'r Edward, U. S. N.  
1875 Taintor, Charles M.  
1875 Terry, Gen. Alfred H., U.S. Army.  
1875 Toel, William.  
1875 Terbell, Henry S.  
1876 Tappan, J. Nelson.  
1876 Totten, Lieut. George Mansfield,  
U. S. Navy.  
1876 Terry, Rev. Roderick.  
1877 Tillinghast, William H.  
1877 Talcott, James. (L. F.)  
1877 Tucker, Rev. William J., D. D.  
1878 Taylor, Rev. Wm. M., D. D.  
1879 Thompson, J. P.  
1879 Turnbull, Robert J.  
1880 Tailer, William H.  
1881 Thompson, R. H.  
1881 Travers, J. P.  
1881 Taylor, A. D.  
1854 Viele, Gen. Egbert L.  
1868 Van Santvoord, C.  
1869 Vanderpoel, Aaron J.  
1870 Van Brunt, Charles H.  
1874 Voorhis, William.  
1874 Vanderbilt, William H.

1874 Vincent, Frank, Jr.  
 1874 Van Rensselaer, K.  
 1875 Vance, Samuel B. H.  
 1875 Van Buren, John D., Jr.  
 1875 Valentine, Lawson.  
 1875 Von Post, H. C. (L. F.)  
 1875 Vanderpoel, A. Ernest.  
 1875 Verhuven, Henry F.  
 1876 Van Hoesen, George M.  
 1876 Van Brunt, Cornelius.  
 1877 Vanderbilt, Cornelius.  
 1877 Voorhees, Charles H.  
 1878 Vanderbilt, William K. (L. F.)  
 1878 Voorhis, John R.  
 1880 Von Hesse, Christer.  
 1880 Van Alen, James H.  
 1880 Van Tassell, Frank L.  
 1881 Valentine, A. A.  
 1854 Webb, William H.  
 1854 Wetmore, Samuel. (L. F.)  
 1854 Witthaus, G. H. (L. F.)  
 1859 Ward, George Cabot. (L. F.)  
 1860 Winston, Frederick S.  
 1866 Wendell, Jacob.  
 1868 White, Alexander M.  
 1869 Weber, Leonard, M.D.  
 1870 Webster, Sidney.  
 1870 Wilson, Gen. Jas. Grant. (L. F.)  
 1870 Wright, E. Kellog.  
 1870 Weston, Theodore, C.E.  
 1870 Ward, T. W.  
 1872 Wetmore, Wm. Boerum. (L. F.)  
 1872 Williams, Stephen C. (L. F.)  
 1872 Wells, Jacob.  
 1873 Weiner, Joseph, M.D. (L. F.)  
 1874 Weyman, Charles S.  
 1874 Waite, Chief-Justice M. R.  
 1854 Wheeler, Everitt P.  
 1874 Wadsworth, Julius.  
 1874 Wetmore, George P. (L. F.)  
 1874 Willets, Samuel.  
 1874 Wyckoff, Jacob F.

1874 Wilder, Marshall P.  
 1874 Walraven, Ira E.  
 1874 Wooster, George H.  
 1875 Work, J. Henry.  
 1875 Wheeler, John V.  
 1875 White, Charles Trumbull.  
 1875 Wilcox, Franklin A.  
 1875 Wilkes, George.  
 1875 Warner, Lewis T., M.D.  
 1875 White, David, C.E.  
 1875 Winslow, Gen. Edward F.  
 1875 Whitehead, Com'r Wm., U.S.N.  
 1875 White, Loomis L.  
 1875 Wissman, J. F.  
 1876 Walker, Evan T.  
 1876 Wedemeyer, A. J. D.  
 1876 Wrigley, Henry E., C.E.  
 1877 Ward, W. S.  
 1877 Waters, James T.  
 1877 Woodruff, Col. D., U.S.A.  
 1878 Whitehead, Henry M.  
 1878 Witherbee, S. H.  
 1878 Wood, Isaac F.  
 1878 Watson, William.  
 1878 Whittemore, Charles.  
 1878 Whittemore, Thomas W.  
 1879 Williams, Richard P.  
 1879 Watson, Francis A. (L. F.)  
 1879 Woodbury, Charles H.  
 1879 Wirths, Maurice.  
 1879 Wolfe, Miss Catherine. (L. F.)  
 1880 Ward, Samuel. (L. F.)  
 1880 Williams, R., Jr.  
 1880 Wilson, James.  
 1881 Wilson, John.  
 1881 Whitehouse, Frederic C.  
 1871 Youngs, Henry I.  
 1874 Young, Mason.  
 1879 Yates, Ellis Samuel.  
 1880 Young, William.  
 1875 Zollikoffer, Oscar.

## FELLOWS DECEASED, 1881.

1874 Appleton, John A.	1873 Lydig, Mrs. P. M.
1870 Bell George.	1875 Michler, Gen. Nathaniel, U.S.A.
1859 Boardman, Andrew.	1874 Phoenix, S. Whitney.
1876 Bowne, Richard H.	1874 Popham, William H.
1876 Buell, James.	1878 Rogers, Charles H.
1879 Bronson, Theodore B.	1854 Ruggles, Samuel B.
1872 Bryce, James.	1856 Stebbins, Henry G.
1874 Constantine, John.	1874 Scott, Thomas A.
1868 Davies, Henry E.	1875 Sherman, Isaac.
1874 Delmonico, L.	1880 Saville, Dr. H. M.
1881 Dodge, Colonel John A.	1880 Sabin, Joseph.
1874 Downer, Samuel.	1872 Tracy, William.
1856 Herring, Silas C.	1875 Uhl, Herman.
1868 Hayes, Dr. Isaac Israel.	1874 Vail, Henry F.
1868 Johnson, Henry W.	

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## CORRESPONDING MEMBERS, DECEASED 1881.

Collins, Lieut. Frederick, U.S.N.	Roberts, General Wm. M.
Morgan, Lewis H.	Van Benthuyzen, Charles

*List of Foreign and Domestic Geographical and other Scientific Bodies with whom this Society is in communication and constant exchange of publications.*

Academia Real das Sciences, Lisbon, Portugal.  
Academy of Natural Sciences, Philadelphia, Pa.  
Academy of Natural Sciences, Davenport, Iowa.  
Academy of Sciences, St. Louis, Mo.  
Academy of Natural Sciences, Minneapolis, Minn.  
American Antiquarian Society, Worcester, Mass.  
American Naturalist, Salem, Mass.  
American Social Science Association, Detroit, Mich.  
Astor Library, New York.  
Biblioteca Nacional, Rio Janeiro, Brazil.  
Boston Society of Natural Sciences, Mass.  
Bureau of Education, Washington, D. C.  
Caucasian Geographical Society, Tiflis, Russia.  
Central Bureau of Statistics, Stockholm, Sweden.  
Charleston Library Society, Charleston, S. C.  
Circolo Geografico Italiano, Turin, Italy.  
Comissão Central Permanente de Geographia, Lisbon, Portugal.  
Cornwall Library, Cornwall-on-the-Hudson, N. Y.  
Cosmos ; Guido Coro, Turin, Italy.  
Essex Institute, Salem, Mass.  
Etablissement Géographique de Bruxelles, Belgium.  
Ferdinandea in Innspruck, Austria.  
Geographical Society of the Pacific, San Francisco, Cal.  
Geographical Society, Lyons, France.  
Geographical Society, Rio Janeiro, Brazil.  
Geographical Society, Hamburg, Germany.  
Geographical Society, Amsterdam, Holland.  
Geographical Society, Marseilles, France.  
Geographical Society, Munich, Germany.  
Geographical Society, Dresden, Germany.  
Geographical Society, Hermannstadt, Austria.  
Geographical Society, Hanover, Germany.  
Geographical Society, Copenhagen, Denmark.  
Geographical Society, Bremen, Germany.

Geographical Society, Madrid, Spain.  
Geographical Society, Weimar, Germany.  
Geographical Society, Bombay, India.  
Geographical Society, Quebec, Canada.  
Geographical Society, Metz, Germany.  
Geographische Anstalt, Gotha, Germany.  
Geological Society, Edinburgh, Scotland.  
Geological Survey, Ottawa, Canada.  
Gesellschaft für Erdkunde zu Berlin, Germany.  
Gewerbeschule, Bistritz, Austria.  
Historical Society, Iowa City, Iowa.  
Historical Society, Madison, Wis.  
Hungarian Academy of Sciences, Pesth, Hungary.  
Hydrographic Office, The Admiralty, London.  
Imperial Russian Geographical Society, St. Petersburg.  
Imperial Royal Academy of Sciences, Vienna.  
Imperial Geographical Society, Vienna.  
Instituto Historio Geografico del Rio de la Plata, Buenos Aires, S. A.  
Instituto Geografico Argentino, Buenos Aires.  
Institut Géographique International, Berne, Switzerland.  
Kais. Königl. Geologische Reichsanstalt, Vienna.  
Königl. Gesellschaft der Wissenschaften, Göttingen, Germany.  
König-Sächs. Gesellschaft der Wissenschaften, Leipzig, Germany.  
L'Exploration, Paris.  
Library of Congress, Washington, D. C.  
Library Department of State, Washington, D. C.  
Literary and Philosophical Society, Liverpool.  
Literary and Philosophical Society, Manchester, England.  
Literary and Historical Society of Quebec, Canada.  
Long Island Historical Society, Brooklyn, N. Y.  
Melbourne Observatory, Melbourne, Australia.  
Ministère de l'Agriculture, de l'Industrie et du Commerce, Rome, Italy.  
Museo Nacional de Mexico, Mexico.  
Mexican Geographical and Statistical Society, Mexico.  
Natural History and Philosophical Society, Belfast, Ireland.  
Nature, London.  
Naval Institute, Annapolis, Md.  
Naturforschende Gesellschaft, Emden, Germany.

N. Y. State Museum of Natural History, Albany.  
N. Y. State Library, Albany.  
North-China Branch of the Royal Asiatic Society, Shanghai.  
Philosophical Society, Wellington, New Zealand.  
Polymathic Society, Vannes, France.  
New York Academy of Sciences, New York.  
New York Historical Society, New York.  
Pulkowa Observatory, Pulkowa, Russia.  
Real Academia Espaňola Arqueologica y Geografica, Madrid, Spain.  
Revue de Géographie, Paris.  
Revue Géographique, 37 Rue Scheffer, Paris.  
Roumanian Geographical Society, Bucharest.  
Royal Geological Society, Dublin, Ireland.  
Royal Society of Victoria, Melbourne, Australia.  
Royal Danish Academy of Sciences, Copenhagen, Denmark.  
Royal Geographical Society, London.  
Royal Academy of Sciences, Munich, Germany.  
Royal Society of Sciences, Upsala, Sweden.  
Royal Prussian Statistical Bureau, Berlin.  
Royal University, Christiania, Norway.  
Royal Society, London.  
Royal Cornwall Polytechnic Society, Cornwall, England.  
Royal Academy of Sciences, Brussels, Belgium.  
Royal Institute for Philology, Geography and Ethnography of Dutch  
India, The Hague, Holland.  
Royal Dutch Meteorological Institute, Utrecht, Holland.  
Royal Hungarian University, Pesth, Hungary.  
Royal Asiatic Society, London.  
Section of the Imperial Russian Geographical Society, Orenburg.  
Smithsonian Institution, Washington, D. C.  
Sociedade de Geographia, Lisbon, Portugal.  
Société de Geographie, Genève, Switzerland.  
Société de Geographie, Lille, France.  
Société de Geographie, Toulouse, France.  
Société de Geographie, Rochefort, France.  
Société Belge de Geographie, Antwerp, Belgium.  
Società Geografica Italiana, Rome.  
Société de Geographie, Paris.

Société Khédiviale de Géographie, Cairo, Egypt.  
Société Belge de Géographie, Brussels, Belgium.  
Société des Sciences Naturelles, Cherbourg, France.  
Société de Géographie Commerciale, Bordeaux, France.  
Société Normande de Géographie, Rouen, France.  
Société de Géographie de Montpellier, France.  
Société Suisse de Topographie, Genève, Switzerland.  
Society of Natural Sciences, Buffalo, N. Y.  
State Library, &c., Boston.  
Statistical Society, London.  
Statistische Amt des Deutschen Reichs, Berlin.  
The Academy, London.  
The Asiatic Society, Yokohama, Japan.  
The Japan Gazette, Yokohama, Japan.  
U. S. Military Academy, West Point, N. Y.  
Poughkeepsie Society of Natural Science, Poughkeepsie, N. Y.  
Toukiyan Geographical Society, Tōkio, Japan.  
U. S. Geological Survey, Washington, D. C.  
United States Coast Survey, Washington, D. C.  
Verein für Erdkunde, Darmstadt.  
Verein für Geographie und Naturwissenschaften, Kiel, Germany.  
Verein von Freunden der Erdkunde, Leipzig, Germany.  
Victoria Institute, or Philosophical Society of Great Britain, London.  
Zeitschrift für Geographie, Lahr, Baden, Germany.

## ADDITIONS TO LIBRARY AND MAP-ROOMS OF THE SOCIETY DURING THE YEAR 1881.

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### PURCHASES.

Narrative of the Mission to Russia in 1866 of the Hon. Gustavus Vasa Fox, by John D. Champlin, Jr., New York, 1873; Our New West, by Samuel Bowles, Hartford, Connecticut, 1869; Travels in Kordofan, by Ignatius Pallme, London, 1844; A Geographical Survey of Africa, by James McQueen, London, 1840; Iowa as it Is in 1856, by Nathan H. Parker, Chicago, Ill., 1856; A Journal of the Captivity and Sufferings of John Foss, Newburyport, n. d.; A Narrative of the Expedition to Dongola and Sennaar, by George Bethune English, Boston, 1823; A Connected View of the Whole Internal Navigation of the United States, by a Citizen of the United States, Philadelphia, 1830; Scenes and Occurrences in Albany and Caffer Land, London, 1827; Excursions to Cairo, Jerusalem, Damascus, etc., by George Jones, A.M., New York, 1836; Los Gringos, by Lieut. Wise, U. S. N., New York, 1850; Floral Home; or, First Years of Minnesota, by Harriet E. Bishop, New York, 1857; Sketches on the Shores of the Caspian Sea, by William R. Holmes, London, 1845; Military Reminiscences in the East Indies, by Col. James Welsh, London, 1830; From Cape Cod to Dixie and the Tropics, by Milton Mackie, New York, 1864; Memories and Observations Made on a Late Journey Through the Empire of China, by Louis Le Compte, London, 1698; Kansas and Nebraska, by Edward E. Hale, Boston, 1854; Beyond the Mississippi, by Albert D. Richardson, Hartford, Conn., 1869; A Gazetteer of the State of New York, by Horatio Gates Spafford, A.M., Albany, 1813; Sketches of Illinois, with a Map, Philadelphia, 1838; Professor Sonntag's Thrilling Narrative of the Grinnell Exploring Expedition, by Professor August Sonntag, Philadelphia, 1857; West India Pickles, by W. P. Talboys, New York, 1866; Journal of a Winter's Tour in India, by Capt. Francis Egerton, London, 1852; Wild Scenes in South America, by Don Ramon Paez, New York, 1852; Progress of Russia in the West, North and South, by David Urquhart, London, 1853; Essay on the Hieroglyphic System of M. Champollion, by I. G. H. Greppo, Boston, 1830; A Narrative of

the Adventures and Sufferings of John R. Jewitt, Middletown, 1815; Fourth Meteorological Report of Professor James P. Espy, Washington, 1857; Sicily and its Inhabitants, by W. H. Thompson, London, 1813; Malerische Reisen in Brasilien von Moritz Rugendas, Paris, 1835; Atlas of Australia, Edinburgh, n. d.; Second Report on Meteorology, by James P. Espy, Washington, 1850; Ten Views in the Island of Antigua, by William Clark, London, 1823; Geological Surveys of Pennsylvania, 1875-78; Memoir of the Atlantic Ocean, by John Purdy, London, 1861; The Amazon, by Franz Dingelstedt, New York, 1870; St. Helena and the Cape of Good Hope, by Rev. Edwin F. Hatfield, New York, 1852; Tent Life in the Holy Land, by William C. Prime, New York, 1857; Boat Life in Egypt and Nubia, by William C. Prime, New York, 1877; Excursions in Southern Africa, by Lt.-Colonel E. Elers Napier, London, 1850; Holland and its People, by Edmondo De Amicis, New York, n. d.; Travels in Russia, the Krimea, the Caucasus and Georgia, by Robert Lyall, London, 1825; A Residence in Bulgaria, by S. G. B. St. Clair and Charles A. Brophy, London, 1869; Notices of Brazil in 1828 and '29, by Rev. R. Walsh, London, 1830; The Danube, by William Beattie, London, n. d.; The Beauties of the Bosphorus, by Miss Pardoe, London, n. d.; Personal Observations on Sindh, by T. Postans, London, 1843; The Eastern Shores of the Adriatic in 1863, by the Viscountess Strangford, London, 1864; Geographical Dictionary of the United States, by Joseph Scott, Philadelphia, 1805; A Voyage to St. Domingo, by Francis Alexander Baron de Wimpffen, London, 1817; Wyld's Map of Central America, London, 1856; Narrative of a Residence at the Capitol of the Kingdom of Siam, by Fr. Arthur Neale, London, 1852; Topography of Thebes and General View of Egypt, by I. G. Wilkinson, London, 1835; A Popular History of the United States, by William Cullen Bryant and S. H. Gay, New York, 1881; The Large Game and Natural History of South and East Africa, by W. H. Drummond, Edinburgh, 1865; An Overland Journey to Lisbon, by T. M. Hughes, London, 1847; Tracks of McKinlay and Party Across Australia, by John Davis, London, 1863; The Mineral and Other Resources of the Argentine Republic in 1869, by Major F. Ignacio Rickard, London, 1870; The Site of Babylon in 1811, by Claudius James Rich, London, 1839; History of the Flag of the United States, by George Henry Preble, Boston, 1880; Murray's Hand-

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*By the Authors.*

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für Erdkunde in Darmstadt; Société Languedocienne de Géographie, Montpellier; Société Normande de Géographie, Rouen; Geographische Gesellschaft in Bern; Société de Géographie de Moçambique; Geographical Society of Japan; Geographical Society of the Pacific, San Francisco; Royal Geographical Society of London; Société de Géographie, Paris; Geographische Gesellschaft in Hamburg; Société Khediviale de Géographie, Caire; Imperial Russian Geographical Society of Tiflis; Verein für Erdkunde in Metz; the Asiatic Society of Japan, Yokohama; Society for Exploration of Central Africa, Madrid; Africanische Gesellschaft in Deutschland, Berlin; Geological Survey of Canada; Edinburgh Geological Society; Association Internationale Africaine, Bruxelles; Wyoming Historical and Geological Society, Wilkes Barre; Buffalo Society of Natural Sciences; N. Y. Academy of Sciences; the Statistical Society of London; Royal Society of Victoria; Royal Society of New South Wales; Imperial Academy of Sciences, Vienna; Poughkeepsie Society of Natural Sciences; the Essex Institute, Salem; Imperial Russian Academy of Sciences, St. Peterburg; Department of Mines of New South Wales, Sydney; L'Académie de Médecine, Paris; Royal Cornwall Polytechnic Society, Falmouth; Historical Society of Wisconsin, Madison; the American Association for the Advancement of Science, Salem; Royal Danish Society of Sciences, Kjobenhavn; Academy of Natural Sciences, Philadelphia; American Antiquarian Society, Worcester; Verwaltung des Medicinalwesens der Stadt Frankfurt a/M.; L'Académie Royale de Copenhague; Société Nationale d'Agriculture de France, Paris; the Literary and Historical Society of Quebec; Naturforschende Gesellschaft in Emden; Literary and Philosophical Society of Manchester; Royal Academy of Sciences of Munich; Meteorological Observatory of Munich; Société Suisse de Topographie, Genève; Société Académique Hispano-Portugaise de Toulouse; Haverford Alumni Association, Philadelphia; Instituto Historico de Rio de Janeiro; Naturwissenschaftlicher Verein für Schleswig-Holstein, Kiel; Société Nationale des Sciences Naturelles et Mathématiques de Cherbourg, Paris; Literary and Philosophical Society of Liverpool; the Lisbon Observatory; Nicolai Observatory in Pulkowa, Russia; American Agricultural Association, New York; L'Académie Royal, Bruxelles; Wisconsin State Historical Society, Madison; Siebenbürgischer Verein für Naturwissenschaften, Hermannstadt; Royal Holland

Society, Gravenhage ; Statistical Bureau of the City of Bremen ; Royal Prussian Statistical Bureau, Berlin ; Society of Natural Sciences of Dresden ; Royal Bohemian Society of Sciences, Prag ; Verein für vaterländische Naturkunde in Württemberg, Stuttgart ; Astronomical Observatory in Rio de Janeiro ; the Victoria Institute ; Verein für siebenbürgische Landeskunde ; Museo Nacional de Mexico ; Statistical Bureau of the Grand-Duchy of Hesse, Darmstadt ; Statistical Bureau of the Grand-Duchy of Baden, Karlsruhe ; Statistical Department of the Inspectorate General, Shanghai ; Imperial German Statistical Bureau, Berlin ; Direction de la Statistique Générale, Rome ; Observatorio Meteorologico Central, Mexico ; Jefferson County Agricultural Society, Watertown ; Ferdinandea für Tirol und Vorarlberg, Innsbruck ; Ministerio de Fomento de la República Mexicana ; Tromsø Museum ; the Mercantile Library Association of San Francisco ; Library Company of Philadelphia ; Smithsonian Institution, Washington ; Royal Statistical Bureau of Sweden, Stockholm ; United States Hydrographic Office ; United States Naval Observatory ; United States Coast Survey ; Department of Interior ; Department of State ; Department of War ; the New York Produce Exchange.

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#### SUBSCRIPTIONS FOR 1881.

Le Tour du Monde, Paris ; Dr. A. Petermann's Mittheilungen aus Justus Perthes' Geographischer Anstalt, Gotha ; Deutsche Rundschau für Geographie und Statistik, Munich ; Revue de Géographie, Paris ; Zeitschrift für wissenschaftliche Geographie, Lahr ; L'Exploration, Paris ; Annales de l'Extrême Orient, Paris ; Nature, London ; The Academy, London ; The American Naturalist, Philadelphia ; Oesterreichsche Monatsschrift für den Orient, Vienna ; The Magazine of American History, New York ; Das Ausland, Stuttgart ; Revue Géographique, Paris, and others.

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PART I.

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TRANSACTIONS  
OF THE  
SOCIETY FOR THE YEAR 1881.

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## TRANSACTIONS OF THE SOCIETY FOR 1881.

Annual Meeting held at Chickering Hall, corner of Eighteenth Street and Fifth Avenue, New York, on Tuesday evening, January 11th, Chief-Justice DALY, President of the Society, in the chair.

The reading of the minutes of the previous meeting was, on motion, dispensed with.

The following named candidates, on the recommendation of the Council, were declared duly elected members of the Society :

*Fellows.*—John S. Kennedy, Edwin Baldwin, Jerome B. Chaffee, Hugh J. Jewett, John M. Carnochan, M.D., Russell Hinman, Frederick H. Hoadley, M.D., Frederick W. Ade, Grenville Kane, Courtland G. Babcock and Thomas Rider.

The annual report of the Treasurer, Mr. Levi P. Morton, was read by Mr. Harlow M. Hoyt, Chairman of Finance Committee, showing a cash balance to the credit of the Society, in the general fund, of \$623.93, and in the permanent fund of \$10,738.87. The report was accepted and ordered on file.

The annual report of the Council was read by Mr. W. H. H. Moore, and is as follows :

The Council reports the condition of the Society as very satisfactory.

Since the last annual report eight meetings of the Society and fourteen meetings of the Council have been held.

On the 13th day of January, 1880, Benjamin Robbins Curtis, Esq., of Boston, read a paper entitled "A Journey Around the World."

On February 10th, 1880, Prof. John B. McMaster, of Princeton College, read a paper entitled "The Bad Lands, or *Mauvaises Terres*, of Wyoming."

On February 27th, 1880, a reception was given to M. de Lesseps at the Society's building, No. 11 West Twenty-ninth Street.

On March 23d, 1880, Chief-Justice Daly, President of the Society, delivered his annual address upon "The Geographical Work of the World in 1878 and 1879."

On April 26th, 1880, the Rev. Edward W. Syle, D.D., read a paper on "Japan as it Is."

On May 25th, 1880, the Rev. B. F. De Costa read a paper entitled "Arctic Exploration, Ancient and Modern."

On October 28th, 1880, a meeting was held for the reception of Lieutenant Frederick Schwatka, U. S. Army, and his associates of the Franklin Arctic Search Party, when addresses were made by Chief-Justice Daly, Lieut. Schwatka, Doctor Isaac I. Hayes and Captain William Arthur, naval attaché of the British Legation in Washington.

On November 18th the Rev. Owen Street read a paper on the subject of "The Changes in the Physical Geography of the Ancient Home of Man in Central and Western Asia."

On December 23d, 1880, Mr. Thomas Davidson, of Boston, read a paper on "The Recent Excavations and Discoveries at Athens and Olympia."

All the lectures but one were illustrated by stereopticon views.

The annual report of the Treasurer shows a satisfactory condition of the finances of the Society.

Sixty-three Fellows have been elected and qualified during the year, and eleven existing Fellows have become life Fellows by the payment of \$100 each. Three corresponding members have been elected.

The publications of the Society during the year have been three Bulletins. Volumes XI. and XII. of the Journal will shortly be issued. The high estimation in which these publications are held in Europe and America is attested by the frequent applications for them by travellers, scientific men and learned institutions.

The Society exchanges and is in correspondence with 119 geographical and other scientific bodies of Europe and America.

The additions to the library of the Society and its map-rooms have amounted to 1,265 items, of which 704 are books; 474 pamphlets, 83 maps and 4 atlases.

The State survey, so long desired and so warmly advocated by the Society, as well as by DeWitt Clinton and Horatio Seymour when they were Governors of the State, exhibits in its Annual Report for 1879 a gratifying amount of work accomplished during the year. The Commissioners stated that "the work of the past season gives the means of making important additions to the State Survey Map of parts of Onondaga, Oswego, Madison and Oneida Counties; locating, as it does, the geographical positions of seventeen villages

and towns. In co-operation with the United States engineers in charge of the improvement of the Hudson, monuments a mile apart have been placed along both banks of the river between Albany and New Baltimore, forming a connected series of permanent landmarks, to which will be referred both the bulkhead lines, established by law, and the boundaries thus established will undoubtedly prove the importance of applying elsewhere a similar system of land surveying." It is known that the work has been pushed during 1880 with as much vigor as the means at the disposition of the Commissioners would permit, and the results of the labors of the past season will equal in value and extent the satisfactory results of the preceding one.

In conclusion, the Council felicitates the Fellows on the very prosperous condition of the Society.

Respectfully submitted,

GEORGE W. CULLUM,

*Chairman of Council.*

The Committee on Nominations presented the following report :

The Nominating Committee appointed to select officers to fill vacancies, under resolution of the Society, passed at its meeting December 23d, 1880, respectfully report the selection of the following nominees for election, in accordance with Chap. 5, Sec. 2 of the By-Laws :

FOR PRESIDENT—Charles P. Daly, LL.D., term to expire, January, 1882.

FOR VICE-PRESIDENT—Francis A. Stout, term to expire, January, 1884.

FOR DOMESTIC CORRESPONDING SECRETARY—James Muhlenberg Bailey, term to expire, January, 1884.

FOR TREASURER—Levi P. Morton, term to expire, January, 1882.

FOR COUNCILLORS—William Remsen, Harlow M. Hoyt, Henry B. Hammond, Clarence King, George R. Blanchard, terms to expire, January, 1884; Charles H. Baldwin, U. S. Navy, term to expire, January, 1882.

Respectfully,

(Signed) THEODORE W. DWIGHT (Chairman),

JAMES O. SMITH, M.D.,

N. P. BAILEY,

*Nominating Committee.*

The above report was, on motion, unanimously adopted.

The Society then proceeded to a ballot, which resulted in the unanimous election of the above-given ticket.

Commander John R. Bartlett, U. S. Navy, was introduced, and read a paper on "The Recent Investigations of the Gulf Stream, by the U. S. Coast and Geodetic Steamer *Blake*," illustrated by models, views and maps.

The thanks of the Society were extended to Commander Bartlett for his very valuable paper, and a copy of it was requested for publication in the Society Bulletin.

On motion, the Society adjourned.

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Meeting (special) of January 25th, held at Chickering Hall, New York.

Chief-Justice Daly in the chair.

The reading of the minutes of January 11th was, on motion, dispensed with.

The following named gentlemen, on the recommendation of the Council, were declared duly elected members of the Society :

*Fellows.*—Commander John R. Bartlett, U. S. Navy ; Joseph F. Stone, Henry P. Butler, F. M. Dean, Charles G. Barber, Thomas Henderson, Jr., H. B. Davies, Godfrey H. Lundie, R. M. Gallaway and A. A. Vantine.

General George W. Cullum, U. S. Army, Vice-President of the Society, was introduced and read a paper on "The Land of Egypt," illustrated with stereopticon views.

The thanks of the Society, on motion, were given to General Cullum for his entertaining and valuable paper, and a copy of it requested for publication.

On motion, the Society adjourned.

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Meeting of February 17th, held at Chickering Hall, New York.

General George W. Cullum, Vice-President, in the chair.

The reading of the minutes of January 25th was, on motion, dispensed with.

The following named gentlemen, on the recommendation of the Council, were declared duly elected members of the Society:

*Fellows.*—John Wilson, John Mildeberger and Thomas S. Adams.

Mr. John Banvard read a paper on "The Hierology and Reading of the Obelisks of Egypt," illustrated by charts, diagrams and paintings on canvas, executed from original drawings made by himself while in Egypt.

On motion, the Society adjourned.

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Meeting of March 25th, held at Chickering Hall, New York. Chief-Justice Daly, President, in the chair.

The reading of the minutes of the previous meeting, February 17th, on motion, dispensed with.

The following named gentlemen, on the recommendation of the Council, were declared duly elected members of the Society:

*Fellows.*—Frederic C. Whitehouse, Augustus L. Brown, Louis Kirsch, Charles B. Canfield, William Libbey, Jr., Clarence F. Pierce and J. C. F. Randolph.

Lieutenant-Commander H. H. Gorringe, U. S. Navy, read a paper entitled "A Cruise Along the Northern Coast of Africa," illustrated by stereopticon views of statuary found at Cyrene, and the ruins of some ancient cities.

The thanks of the Society, on motion, were given to Commander Gorringe for his able paper, and a copy of it was requested for publication.

On motion, the Society adjourned.

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Meeting of May 10th, held at Chickering Hall, New York, General George W. Cullum, U. S. Army, Vice-President, in the chair.

The reading of the minutes of the previous meeting, March 25th, was, on motion, dispensed with.

The following named gentlemen, on the recommendation of the Council, were declared duly elected members of the Society:

*Fellows.*—Ralph N. Ellis, E. Stern, Rev. M. Nichot and Ross Raymond.

*Corresponding Member.*—Doctor Ernesto do Canto, St. Michaels', Azores.

Mr. James Douglas, Jr., read a paper on "Chile: its Geography, People and Institutions," illustrated with stereopticon views.

On motion, the thanks of the Society were extended to Mr. Douglas for his valuable paper, and a copy of it was requested for publication.

On motion, the Society adjourned.

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Meeting of November 25th, held at Chickering Hall, New York, General George W. Cullum, Vice-President, in the chair.

The reading of the minutes of the previous meeting, May 10th, was, on motion, dispensed with.

The following named gentlemen, on the recommendation of the Council, were declared duly elected members of the Society:

*Fellows.*—Flavel McGee, R. H. Thompson, John R. Andrews, Leon Abbott, Christopher C. Baldwin, Augustus F. Docharty, Joseph H. Fairbanks, A. Gomez, Woodbury G. Langdon, Rev. M. A. Hunt, O.M.I., Joseph J. Little, George Green, Eben S. Allen, Edwin R. Livermore, William Berend, Cecil de Wilton Grey and A. D. Taylor.

Doctor Isaac Israel Hayes (Arctic Explorer), was introduced and delivered a lecture on "The Water-Ways of New York," considered in relation to the transportation interests of the State and the commerce of the city.

On motion, the thanks of the Society were given to Dr. Hayes, for his eloquent, interesting and able lecture, with the request that he prepare it for publication in the Society's Journal.

On motion, the Society adjourned.

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Meeting of December 21st, held at Chickering Hall, New York, General George W. Cullum, U. S. Army, Vice-President, in the chair.

In calling the meeting to order, General Cullum said:

"Before proceeding to the business of this meeting it is manifestly proper that it should be officially announced to the Society that the *Jeannette*, fitted out by the munificence of our enterprising and

most liberal fellow member, Mr. James Gordon Bennett, has been crushed in the ice, but that fortunately, most of her crew, including the noble Captain De Long, after terrible suffering, have escaped with their lives to the mouth of the Lena River, and it is hoped are far on their way to their homes.

"The full account in this morning's papers renders it unnecessary that I should give the details of this sad catastrophe which has been long feared, and has now terminated the ultimate expectation that American skill and valor would soon force a way to the Pole, and thus solve the interesting Arctic problem of either an open or paleocystic sea.

"I will now point out on the map before you the course of the *Jeannette*, which left San Francisco, July 8, 1879, passed through Behring Strait, and was finally abandoned June 11, 1881, near the New Siberian Islands, thus almost literally fulfilling the prophecy of Lieutenant Hovgaard, of the Danish Navy. He says: 'If the *Jeannette* were left far east of Cape Chelyuskin, it would have been more natural to go for the inhabited places at the Lena, and I am therefore of the opinion that her crew must have come ashore somewhere near.'"

General Cullum then indicated with a rod on the large map behind him the course of the *Jeannette* from Behring Strait to the point where the crushing in the ice took place, and then the course to the mouth of the Lena River traversed in the small boats.

General Cullum announced to the Society the death of Doctor Isaac I. Hayes, and submitted a biographical sketch of this eminent American Arctic explorer (see Bulletin No. 3, 1881).

Mr. Elial F. Hall, then offered the following resolutions, which were unanimously adopted:

*Resolved*, That the members of this Society, while they bow in reverent submission to the will of Providence, who has so suddenly taken from them their associate, Doctor Isaac I. Hayes, cannot omit to place upon record, at this their first meeting since his death, an expression of the deep regret and sincere sorrow over so untimely and irreparable loss which they have thus sustained.

*Resolved*, That while in the lifetime of the deceased, this Society and its members were justly proud of those achievements which placed him in the front rank of Arctic explorers, and crowned him with a world-wide fame; so now that he is gone from them, they

will ever cultivate and cherish the memory of those achievements as a precious inheritance from him to them.

*Resolved*, That the lively interest taken by the deceased in the progress of geographical science, his zeal and enthusiasm for exploration and discovery, his readiness, ability and eloquence in the presentation and discussion of geographical subjects, and his other qualities of mind and heart which endeared him to a large circle of friends, and made him a favorite and ornament of this Society, will ever be held in affectionate remembrance by its officers and members.

*Resolved*, That the Society extends its heartfelt sympathy to the afflicted family of the deceased, and that a copy of these resolutions be transmitted to them by the Secretary.

The reading of the minutes of the previous meeting, November 25th, was, on motion, dispensed with.

The following named gentlemen, on the recommendation of the Council, were declared duly elected members of the Society.

*Fellows*.—Herman O. Armour, Henry L. Clinton, George Griswold Haven, Bradish Johnson, Jr., George A. Robbins, Fred. E. Ballin, Nathan Chandler, James A. Garland, Clarence F. Fearing, Charles B. Hoffman, Samuel D. Babcock, John C. Giles, Edward A. Farrington, William R. Grace, Frederick W. Foote, T. P. Travers, Silas C. Evans, J. Bowers Lee, Brayton Ives, Thomas B. Coddington, John A. Dodge, Robert Ray Hamilton, James Gallatin, Henry Landon Backus, William H. Fearing, Henry A. Oakley, William Dowd, Henry C. Andrews, Richard S. Haines, Frederick W. Rhinelander and Charles A. Post.

The President, upon motion, appointed Dr. David P. Holton, Chairman; Dr. Thomas Addis Emmet and Mr. David S. Banks, the Nominating Committee to select suitable candidates for officers of the Society, under Chap. V., Sec. 2, of the By-Laws, and to report at the Society's annual meeting in January, 1882.

Rev. William Elliot Griffis (author of "Mikado's Empire," and late of the Imperial University of Tokio, Japan) was introduced and delivered a lecture on "Corea, the Hermit Nation," illustrated by stereopticon views.

On motion, the thanks of the Society were given to Mr. Griffis, and he was requested to prepare a copy of his paper for publication.

On motion, the Society adjourned.

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## PART II.

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### PAPERS READ BEFORE THE SOCIETY

DURING 1881.

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*Note.—THE AUTHORS ALONE ARE RESPONSIBLE FOR THE CONTENTS OF  
THEIR RESPECTIVE PAPERS.*

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## THE LAND OF EGYPT.

BY  
GENERAL GEORGE W. CULLUM, U. S. ARMY,  
Vice-President of the Society.

When I offered to prepare a paper upon Egypt, I little anticipated the difficulty of compressing into an hour's discourse even the leading facts connected with its geography and monuments. Thirty years ago, I visited this wonderful and captivating region, my reminiscences of which I will now give as succinctly as possible.

We embarked on board of a French steamer in the lovely Bay of Naples, in January, 1851, for the Land of the Pharaohs, then an almost *terra incognita* to the American traveler. Speedily we wended our way along the coast of Calabria; passed fire-spitting Stromboli; escaped Scylla and shunned Charybdis; looked up to *Ætna*'s dread crater; and safely reached Malta, where, for a day, we wandered among its vast docks, labyrinthian fortifications and the abodes of famous knights. Early on the fifth day, after leaving Malta, a bright star in the east glimmered on the morning horizon. It was the welcome beacon of Alexandria, lighting us to the cradle of civilization from the identical spot where once rose that far-famed monument of science and humanity—the Pharos of the Ptolemies. For centuries, this fifth wonder of the world filled the imaginations of historians with the most exaggerated ideas of its grandeur. Even the grave Josephus would have us believe that its friendly rays shed their brilliancy over the sea for more than forty English miles, which would have required a lantern-tower 550 feet in height, far out-topping the Cheops pyramid, or Cologne Cathedral, the loftiest structure of the world.

Approaching the African coast, the turbid waters indicated that we had reached the mighty Nile, that marvellous river of fertility and of poetry, majestically moving more than 4,000 miles, over

half the length of a vast continent, and which was a god to the ancients, the image of the divinity being borne from place to place in solemn procession with chanting and prayers for the overflow of the land. It is the largest river of the eastern hemisphere, and in length ranks third of all in the world. Through about thirty-two degrees of latitude, it winds its sinuous way to the sea, descending 4,168 feet from its fountain reservoir of the great Victoria Nyanza—thus named, in 1858, by its so-called discoverer, Speke, after a reigning sovereign, though mapped by Ptolemy 1,700 years before, and known to the learned Eratosthenes in the third century B. C. Entering Egypt at the first cataract, it flows through the middle of the land and empties into the Mediterranean by several mouths, the principal of which are the Damietta and Rosetta. The Nile in Egypt has an average breadth of 700 yards; and its valley, including the barren land immediately flanking it, varies from 14 to 32 miles, of which, nowhere, more than nine are arable. Its banks, the eastern called the Arabian and the western the Lybian, rise at places to 1,000 feet, resembling colossal canal embankments, between which the river has forced its passage through the plateau of "Nubian sand-stone" to Gébel Silsileh, and, below this famous quarry, has worn its channel in the nummulite limestone. Beyond the valley, on either side, are vast deserts. Through the eastern, running nearly parallel to the Red Sea, stretch the Arabian mountains, rising to 6,000 feet at Gébel Gareb; and within the western are the many oases of Lybia, the beauty and fertility of which have been much exaggerated.

It has been truly said that Egypt was the gift of the Nile. Lepsius found on the rocks of Semneh, above the second cataract, inscriptions showing that at the time of the twelfth Egyptian dynasty the level of the Nile was 26 feet higher than in 1843. Sir Gardner Wilkinson, following up these curious developments, proved, by tracing the extent of the mud deposit, that a vast inland body of water, as large as Lake Superior, formerly extended through about seven degrees of latitude, from the mouth of the Astaboras (the last tributary of the Nile) to Silsileh, where the river still passes through a narrow rocky gorge but 365 yards wide. The Coptic name of this chasm was Golgel, which appellation may have been borrowed from the cataclysm that occurred there when an earthquake enlarged the

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passage from the great Ethiopian Lake to the head of a narrow estuary, which the geological formation shows to have once put up from the Mediterranean along the present Nile valley. During the pliocene period this inlet probably became filled with lagoon deposits from the higher plateaus beyond Egypt, which were subsequently carried further down by the increased current of the stream. Herodotus, who never went further south than Elephantine, says that the priests told him that the Nile came from the ocean and flowed again into the ocean. This statement much perplexed him, but it is of easy solution, if we suppose they meant that it flowed from the great inland sea of Ethiopia to a gulf of the Mediterranean. The Father of History also informs us that a sacred scribe of Sais told him that half of the water of the Nile ran northward into Egypt, and half to the south towards Ethiopia. This would be meaningless unless the great lake had had another outlet (now dried up) into the Rea Sea.

Great as are these changes, geology shows still greater in the lapse of ages. It is evident that the continent of Africa was once a vast island, the Arabian Gulf having been formerly united with the Mediterranean. When the land rose from the water, the Isthmus of Suez appeared, driving the head of the Red Sea to the south, to which it is still tending. Egypt also underwent many physical mutations. Herodotus says: "The whole region above Memphis, lying between the two ranges of hills, appeared evidently to have formed at one time a gulf of the sea." And again he says: "In the time of Menes all Egypt, except the district of Thebes, was a marsh, none of the land below Lake Meris showing itself above the surface of the water." Rennell, in his work on the geographical system of Herodotus, observes that "the configuration and composition of the low lands leave no room for doubt that the sea once washed the base of the rocks on which the pyramids of Memphis stand." Hundreds of centuries have doubtless elapsed while this great lagoon of Egypt has been gradually filled by the silt deposits of the Nile, making it now the garden of Africa. Lyell estimates that the least time required to form the present delta and alluvial plain of the Mississippi is more than 100,000 years; and Agassiz says it would require 135,000 years, at the average rate of coral growth, to build up the southern half of Florida from the sea.

Yet other changes in the Nile have taken place. Before the

records of history the great bulk of its waters rushed westward through the gorge of the Feiyoum, and from the bend of the Rosetta branch (near the modern town of Warden), to waste their fertilizing energies in the sand of the desert, and finally to be absorbed by it ; or to make their way to the sea through the barren passes of the Bahr-bela-ma and the valley of the Natron Lakes. King Menes, of the first dynasty, to rescue from utter sterility and to drain the pestilential marshes of the valley between the hills of Tourrah and Abousir, in which are ancient Memphis and modern Cairo, diverted these western branches by cutting a gigantic canal, protected by walls and levees, extending from south of Beni-sooef to El Kattah. He also excavated a vast reservoir at the foot of the mountain of Abousir, on the western bank of the new course of the Nile, to receive the superfluous waters of the overflow. This reservoir must not be confounded with the Lake of Merois, further south, near which was the famous Labyrinth, built by Amenemha III., of the twelfth dynasty.

Of the first civilization of Egypt we are in as great doubt as of its early geography; for the student of history is in a perpetual maze over the chronology of antiquity, where dates differ by centuries and even milleniums, in order to support dogmatic theories like Usher's, or to harmonize the scholastic fancies of Jewish rabbins. The earliest historian of Egypt is Manetho, a scholar of eminent character, and of the highest reputation for wisdom and learning, a few fragments of whose writings Eusebius, Josephus and others have preserved. He tells us that king Menes, the first who united Upper and Lower Egypt into one monarchy, began his reign 3893 B. C., when civilization, letters, science and political organization had long existed, and a national character had been fully developed. Many centuries, of course, were necessary to evolve such an enlightened and powerful people from the darkness and disorder of primitive savage life. Of the duration of that long period, fortunately, we have, in the writings of Plato, a record of a statement of the priest of Sais made to Solon more than six centuries before our era.

“ You Greeks,” said he, “ are novices in knowledge of antiquity. You are ignorant of what passed, either here or among yourselves, in days of old. The history of eight thousand years is deposited in

our sacred books; but I can ascend to a much higher antiquity, and tell you what our fathers have done for nine thousand years. I mean their institutions, their laws, and their most brilliant achievements."

Though neither Solon nor Plato doubted this statement, it fortunately is more than corroborated by physical means of measuring Egyptian antiquity. Mr. Leonard Horner, in 1851-'54, at the suggestion of the Royal Society of London, made, in the latitude of Heliopolis, 51 borings, in that of Memphis 27, and in various other places 17—in all 95—extending from the Arabian to the Lybian desert. These were sunk through the Nile deposit down to the primitive surface. The character of the deposit was uniform from top to bottom. Pottery and bones of existing species of quadrupeds were found at all depths, and articles of man's manufacture were discovered at the very bottom. Though these borings fail to establish an exact chronometric scale, they are approximate data for ascertaining the period of the first sedimentary deposits. One of the borings was made near Memphis, close to the pedestal of the statue of king Rameses II., which was erected 1260 B. C., and consequently, in 1854, had stood there 3,114 years. During that time the alluvium had accumulated around the pedestal to the height of 9'-4", or about  $3\frac{1}{2}$  inches in a century. The alluvium below was found to be 30 feet deep from the bottom of the pedestal, which would give, for the date of the first deposit, 11,660 B. C., or even earlier, as the lower alluvium would be compressed by the superincumbent weight. Herodotus, who visited Egypt about 460 B. C., says that the priests of the temple of Phtah at Memphis told him that, from the time of Menes, 341 generations of men had passed away from the earth, which would give 11,366 years, counting three generations to a century; that is to say, the Egyptian monarchy was founded 11,820 B. C., which marvellously accords with the results of the borings. At this early date, of 137 centuries ago, it is thus pretty conclusively proved that the original soil was occupied by a people having all the appliances of civilized life. Some learned Egyptologists extend the age of Egyptian polity to 13,000 B. C., which corresponds to about half the cycle (25,868 years) of the precession of the equinoxes, and accounts for the old tradition that the fixed stars, which formerly appeared

in the West, were the same as seen in the East by the shepherds of Bethlehem, and which guided the Magi to the manger-cradle of the Son of Mary in the city of David.

If the age of Egypt's civilization be doubtful, the question of how it was first populated is still more difficult to determine. Some contend that Egypt itself was the cradle of man and the primitive abode of our race. Others affirm that from Asia it crossed that bridge of nations, the Isthmus of Suez, to find new household gods on the banks of the holy Nile, and subsequently emigrated southward, they adducing in proof that the pyramids are older monuments than any in Upper Egypt or Nubia. A third party maintains that civilization descended the Nile, whose higher valley is geologically the oldest, and that Thinis (Abydos), in Upper Egypt, was a royal city, where kings reigned long before the time when Menes (who was born in Thinis) built Memphis, which city ante-dates the pyramids. Each of these theories has its able advocates, but the latter is best supported by ethnology, philology and archaeology.

Ancient Arabia, which had far more extended limits than the country hemmed in between the Persian Gulf and Red Sea, was known to the Hebrews as the Land of Cush, and to the early Greeks as Ethiopia. This seat of an enlightened and enterprising civilization had its colonies "from the extremity of the east to the extremity of the west." One of these colonies of the Land of Cush, that mother of nations, the old Sanskrit books tell us crossed the Straits of Bab-el-Mandeb, fifteen miles wide, from *Asiatic* to *African* Ethiopia, and thence, before the Cushite race had had any admixture with the native negroes, migrated northward, first to Upper and thence to Lower Egypt, as the firm land, "the gift of the Nile," appeared. Even down to the days of Augustus Cæsar, the younger Juba says that African Ethiopia was held by the Arabians, a much superior race, socially and intellectually, to the natives, and totally differing from them in color, features and conformation of skull. "Every one," says Sir Gardiner Wilkinson, "who considers the features, the language and other proclivities of the ancient Egyptians, will feel convinced that they are not of African extraction, but that, like the Abyssinians and many inhabitants of the known valley of the Nile, they bear the evident stamp of an Asiatic origin." The fellah Arab, or modern Egyptian, has preserved many of the characteristics of

his ancient progenitor, and the traveler is often struck, when looking upon the ancient monuments or mummies, by the similarity of an early representation to some one of the natives standing by, priding himself upon his Asiatic descent. There is one marked difference, however, for Herodotus tells us that in old times "they bathed twice every day in cold water, and twice each night," a degree of cleanliness unknown to the unwashed modern Egyptians.

These speculations have led us far from our travel's history up the Nile, which we must now resume.

By daylight we were within the broad Bay of Alexandria, divided by the Heptastadium dyke into the old and new ports. We of the modern world could scarcely realize that here was the fabulous abode of the ancient sea-god Proteus; the harbor of refuge, as sung by Homer, when Troy was besieged; and where, many centuries later, Cæsar, after the battle of Pharsalia, pursued Pompey, though perhaps as anxious to meet the fascinating Cleopatra as to rid himself of a rival to the throne of empire.

Landed on shore, a new peril awaited us in hordes of donkey-boys, guides, commissionaires and the whole pack of legal robbers, who almost tore us and our baggage in pieces to secure a few piasters for nominal services. To make my only escape from this bedlam of shouting boys, importunate beggars and barking dogs, I mounted the first good-looking beast at hand, which a young Arab, quickly taking us in as Americans, called, for the nonce, "Uncle Sam." After breakfast I again bestrode my pygmy Bucephalus, warranted to be an uncommonly easy donkey, but which bounced me up and down like the piston-rod of a steam engine. After churning the airs of heaven all day, I saw little of interest. On the north were the poor catacombs, worn by the restless waves, but still bearing the proud name of the Baths of Cleopatra. Near the shore remained the two obelisks which once adorned a temple of Heliopolis—one now piercing the London fogs on the Thames embankment, and the other towering in the more congenial air of our own Central Park. At the southwest stood the solitary column, with crumbling base and Corinthian capital, called Pompey's Pillar, which possibly was a fragment of the Temple of Serapis, or, more probably, was erected to commemorate the capture of Alexandria by the arms of Diocletian, A. D. 297, from the rebel Achilleus; and, in this same quarter, were

the remains of an ancient Greek church, on whose walls were figured saints, martyrs and apostles, and whose roof, perhaps, in the dawn of Christianity, had echoed to the preaching of Saint Mark when, in the reign of Nero, he came from Jerusalem to be, according to learned authorities, the first bishop of Alexandria. These were all, save ruins, of that great city of the Nile, once containing 600,000 inhabitants, girdled with fifteen miles of fortress walls, and adorned with all the arts of Greece and the wealth of Egypt.

It seemed a dream that I was now gazing upon Alexandria, the once brilliant capital of the Ptolemies, and the honored seat of learning and civilization for eight centuries; where Euclid, Eratosthenes, Hipparchus, Appollonius, Conon, Claudius Ptolemy and other noted scientists filled the world with their fame; where Appelles painted, Aratus sang, Lucian wrote, and Aristarchus plied the lash of criticism; where Philo, Clement, Ammonius, Origen and Justin Martyr held schools of theology; where arose that controversy about the nature of Jesus which has since divided the Christian world; and where Athens in her decadence and Rome in her adolescence enjoyed a generous hospitality! Where now are those two grand avenues through which passed triumphal processions, gorgeous with every thing costly in art and scarce in nature, and thronged, from dawn to dark, the multitudinous populace sweeping along to the four famous city gates? The place of the luxurious palanquins has been usurped by lazy donkeys, and the stately chariots, in crimson and purple, have given way to the cumbrous camel and the dromedaries of Midian! Where are the ships of Tyre and Tarshish with their silver and gold, and the rich commerce of the Orient, which once crowded this chief emporium of the thriving trade of the richest city of the old world? The casual steamer and a few fishing boats alone replace them! Where are the temples, palaces and public buildings which once covered one-fourth of the area of this rival of Rome? Rubbish and ruin alone make reply! Where are those majestic colonnades extending between the gates of the Sun and the Moon, and the Augustin city of Nicopolis, marking the spot of the defeat of Antony's partisans and the overthrow of the Egyptian monarchy? The howling desert answers, dust thou wert and unto dust have returned! Where are those gay promenades lined with statues of gods and heroes, and shaded with mulberry-trees and wide-spreading syca-

mores? All cut down by the scythe of time! Where are those blossoming gardens, ripe vineyards, and cooling palm-groves which bordered in beauty the Mariotis lake? Neglect and a torrid sun have consumed them to ashes and nothingness! Where is the hippodrome crowded with pleasure-loving Greeks, Syrians and Egyptians; the gymnasium, with its wrestlers and boxers panting for the fray; and the holy sanctuaries filled with white-robed priests? Gone! for Momus and the gods are no longer worshiped. Where are the Museum and Serapeum with their priceless libraries, each of 700,000 volumes, the labor of as many weary brains? Cinders and smoke alone can tell! In fine, where are all its marble monuments, thousands of stately structures, hundreds of theatres, countless baths, long canals, subterranean reservoirs, and miles of aqueducts? The besom of destruction has passed over them! All, all of the relics of the gay capital have faded away like the mantle of the great Macedonian after which the city was planned; and even the golden mausoleum of the mighty conqueror has been stolen, his sarcophagus perhaps adorns the British Museum, and his body, conveyed in costliest state from Babylon, possibly, as Shakespeare conjectures, has become loam "to stop a beer-barrel!" All have vanished into the desert sands from whence, more than two thousand years ago, arose that giant child of Greece, which was the renowned abode of philosophers, scholars and heroes! No monument remains of victorious Cesar, nor of loving Anthony, and no echo recalls to life the voice of her "who beggared all description," the sovereign of hearts, the all-conquering Cleopatra! Alike in dust and silence, with triumphant Greeks and Romans, are all traces of the Arabian Omar, save the detested memory of that Caliph whose general, for six months, warmed his four thousand baths with precious papyrus manuscripts and books, because "if contrary to the Koran they were evil, and useless if like it." Thus in the year 640, on the 22d of December, the anniversary day of the planting of Christianity on Plymouth Rock, Mahommedism was triumphant at Alexandria, then crowded with works of art and the fruits of a long civilization. Egypt then ceased to be a Roman province professing the religion of Jesus. This renowned nation, hoary with ages of wonderful history, and, for nearly a thousand years, the

abode of Greek culture, had come to an end and reverted to that Arabia from which she had sprung.

Leaving Alexandria, by steam we soon reached Atfeh, and thence by the Mahmoodéh canal were transported to Boolak, the port of Cairo. Here, in a serene atmosphere, under a crystal sky, with the warmth of an Italian May, we turned our gaze from the distant Pyramids to the magic beauty of the nearer capital of Egypt, with its gilded domes flashing in the sunset, and its crescent-crowned minarets twinkling like evening stars in the transparent ether, bringing back to us the "Arabian Nights" of our boyhood's dreams.

For a week, in the golden atmosphere of this poetic paradise, we wandered amid the airy arabesque borders of Cairo, seldom going within its central uncleanness. The site of Cairo is said to be that of the Babylon of Cambyses, built upon the ruins of the pre-existing Latopolis of the Egyptians. The present city was founded A.D. 970; its citadel was built by Saladin in 1176; and, till the Turkish conquest in 1517, Cairo was the capital of the Sultans of Egypt. It is doubtless, the largest existing Arab city, the natives regarding it as the mother of the world. The streets are narrow; the stone houses look gloomy; hundreds of grotesque minarets point the faithful to their multiform mosques; scattered around are fine specimens of Arabian architecture, built of the spoils of Memphis and Heliopolis; bazaars on every side are filled with oriental merchandise; cooling fountains receive the thanksgivings of thirsty Moslems; and the dirty thoroughfares are filled with a tide of busy life till the muezzin calls the hour of evening prayer.

Our first excursion from Cairo was to Heliopolis—"The City of the Sun"—called in the Bible by the various names of "Beth-shemish," "On" and "Aven." Of this famous city, whose learned and numerous priesthood swayed the entire land of Egypt and attracted the students of every clime, nothing now remains to warm the traveler's love of knowledge and of morality save buried ruins and one lofty obelisk—"The Finger of the Sun"—pointing out the site of its former princely grandeur, and to that temple of the Day-god, whose worship has passed from eastern Persia to western Peru, nearly completing the circuit of the earth. This lonely Pillar of On, erected by Osirtesen I. more than five thousand years ago, yet

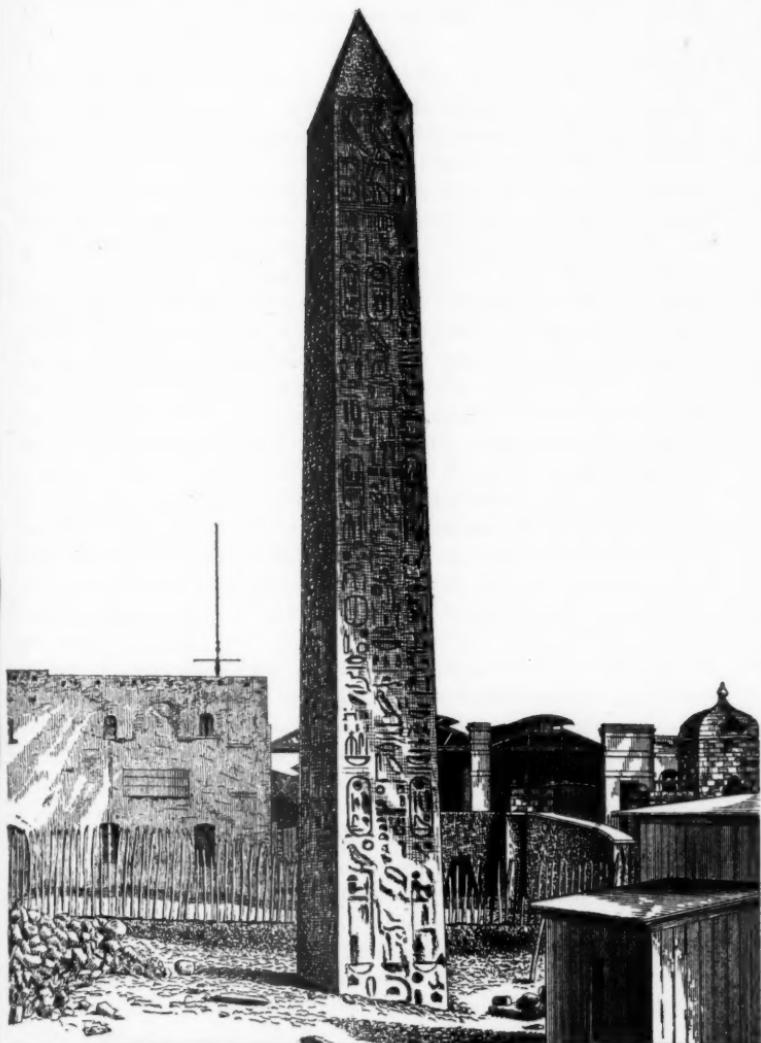
stands, the solitary milestone of the march of history, the same as in the days of the worship of the Phoenix the bird of Ra, and of the bull Mnevis, revered here as was Apis at Memphis. Probably, under its shadow Abraham with his flocks passed from parched Canaan to drink of the waters of the Nile. Joseph, the adopted son of the last of the Hyksos or Shepherd Kings, here came to learn the wisdom of the Egyptians, and later to wed the fair Asenath, the daughter of the high priest Potipherah. By it passed mighty armies of great Pharaohs to victories on the Tigris. From this region departed the children of Israel ; and, since the days of their deliverance, here has been the battle-field of the infidel Persian, the conquering Roman, the ruthless Moslem and the invading Frank. Here the stern Jeremiah, with the spirit of an iconoclast, foretold the destruction of "the images of Beth-shemish," which prophecy the sacrilegious Cambyses so soon fulfilled. Here Solon studied the Egyptians' customs; Pythagoras learned their mystic lore ; and Plato, from the death-pallet of Socrates, came to investigate during thirteen years their philosophy and the doctrine of the immortality of the soul. Here, in the land of the balsam-tree, escaping from Herod, a divine teacher of theocracy rested, with his parents, Joseph and Mary, from the meridian sun under a wide-spreading sycamore, and drank from the fountain since sacred to every weary pilgrim from the land of Goshen. And, by a singular coincidence, on this spot where the infant Jesus had stood, Paganism made its last struggle against the Moslem invader. "In that day," prophesies Isaiah, "shall there be an altar to the Lord in the midst of the land of Egypt, and a pillar at the border thereof to the Lord, and it shall be for a sign and for a witness unto the Lord of Hosts in the land of Egypt." As it has stood through the milleniums of changing dynasties, there this memorial monolith of Osirsesen still stands, the oldest and most typical of all the obelisks of Egypt.

This veteran "Needle of Pharaoh," ancient before Nineveh was founded, is one of thirty-three now standing, of which number sixteen are in Italy, six in England, five in Egypt, two in France, two in Constantinople, one in Germany and one in America. The latter, transported to and erected in our own Central Park by the indefatigable labors of Captain Gorringe, U. S. Navy, is to us even of greater interest than the celebrated "Pillar of On." From the

quarries of Syene, nearly under the Tropic of Cancer, it was floated down the Nile to the City of the Sun; and, after the battle of Magiddo on the plain of Esdraelon, the great architect king Thothmes III., who ruled the whole civilized world from the southern most bounds of inner Africa to the "columns of heaven," in the land of Naharain, raised it before the temple of Toum, or the "Evening Sun," where the priest Osarsiph, whose name was changed to Moses, subsequently received his education. For about sixteen hundred years it stood at Heliopolis, when it was removed to Alexandria and set up in front of the Cæsarium. Till recently it has been supposed that it and its fellow, the London obelisk, were re-erected in the reign of Tiberius, A. D. 16-37. This date is now proved erroneous by an inscription, in both Greek and Latin, on one of the supporting bronze crabs or feet, which reads: "In the eighth year of Augustus Cæsar, Barbarus, prefect of Egypt, caused this obelisk to be placed here, Pontius being architect." Thus this votive monument of three of the greatest Pharaohs became a Roman trophy of Augustus Cæsar to commemorate his sovereignty over Egypt after the battle of Actium, 31 B. C., in which the celebrated queen Cleopatra, with Marc Antony, took an opposing part. When made prisoner by Augustus, she, to escape being exhibited in his triumphal procession in Rome, killed herself with the poison of an asp, 30 B. C., which was seven years before this obelisk, misnamed "Cleopatra's Needle," was erected in Alexandria, not in her honor, but to attest her death and the destruction of her kingdom.

It is unnecessary here to speak of the history of the skill, labor and indomitable perseverance displayed in its successful transit to and erection in this city, as Captain Gorringe himself will soon give it in a most satisfactory manner. Suffice it here to say, that the monolith is 69 feet 2 inches high, and its top now stands 81 feet 9 inches above the foundation. When first set up, 3,500 years ago, it had only a single vertical column of inscriptions on each face, to which the vain-glorious Rameses II., about two hundred years after, added two outside lines, while Seti II., less than a century later, supplemented these with his own cartouche and some hieroglyphs on the lower part of the monolith. Thus, as frequently occurs on the Egyptian monuments, the glory of more kings than the founders attaches to them.





NEW YORK CENTRAL PARK OBELISK,  
as it stood at Alexandria in Egypt.

Our obelisk, since it was quarried near the torrid zone, has traversed the entire length of Egypt, most of that of the Mediterranean Sea, and the whole width of the Atlantic Ocean—a distance of about 6,400 miles—proving itself a first-rate sailor for an old salt of thirty-five centuries, having in the course of his long life seen Moses ; Pharaoh and his host going to their destruction in the Red Sea ; Shishak marching to the conquest of Jerusalem ; Cambyses desolating the land ; Solon, Plato, Heroditus and other Greek students of Egyptian lore ; Alexander the Great on his victorious expedition through the land of Goshen ; six and a half centuries of Roman sovereignty and Christian struggle at Alexandria ; all the long line of Moslem rulers since Caliph Omar ; and now the million dwellers in this great metropolis, whose site even was unknown to the Eastern world when this obelisk had had an existence of two thousand years !

Returning from Heliopolis, we visited the tombs of the Memlooks, those magnificent mosques, with sky-piercing minarets, under whose lofty domes sleep those renowned Sultans who, with the sword in one hand and the Koran in the other, crusaded the world.

The next morning, like Balaam, we rose to make other excursions, but the angel of the Lord was not in the way to counsel our ass, a more perverse beast than any from the days when Solomon took his donkey-ride into Jerusalem to those when Sancho Panza proudly bestrode his famous dapple-gray. Onward we bounced, alike regardless of the toes of quiet Cairenes, Frank howadjis, Nubian boatmen, Bedouin bandits, Albanian brigands, Mecca pilgrims, Persian dervishes, Copt priests, Arab sheiks, or Turkish officials in state attire, one of whom I accidentally tumbled into a large egg-basket, transforming him into a golden omelette. As it would be tedious to recount all our rambles, we will simply say we visited Boolak, where is now a famous museum; the island of Rhoda, named from the roses for which it is still famous, and celebrated as being the place where the infant Moses was “drawn from the water” by Thermuthis, the daughter of Pharaoh; the citadel of Saladin, from which the well-mounted Emin Bey made his fearful plunge down a precipice to escape from the massacre of the five hundred entrapped Memlooks, whose blood still cries from the rocky deep of “Yoosef’s well,” within its walls; and the enchanting garden of Shoobra, with

its orange and citron groves, clumps of weeping willows, vine-clad arbors, flower-fringed walks, gushing fountains, musical aviaries, graceful kiosks and its marble palace in the midst of this new Egeria. Wherever we wandered, through the mulberry and acacia-shaded avenues, was a Claude landscape of purple hills, green palm groves and golden sunlight flashing beauty from countless domes and slender minarets, and illuminating the obelisk summit of Heliopolis and the pyramid peak of Cheops, which glowed like twin beacons to light us up the valley of the historic Nile. So far as I saw, on the eastern bank are all the obelisks, emblems of the "Rising Sun;" and on the western shore are the Pyramids, types of the "Setting Sun"—the symbols of life and death thus ever confronting each other.

The last of the wonders of Lower Egypt we were yet to see. Accordingly we crossed the Nile, and, like Abraham, when he left Sarah in the hands of Pharaoh, were hurrying to the pyramids across the plain, where Strabo says there were long ranges of Memphis palaces, which neither he nor we saw, for, long before his day, the "City of Noph" had vanished and the sacred enclosure of Apis was no more. The only visible remnant of the once-proud capital was the colossal statue of Rameses, the great Sesostris, prostrate in the sand. The prophecy of Ezekiel had overtaken it: "I will destroy the idols, and I will cause their images to cease out of Noph." But amid all this desolation, the pyramids still survive the oldest and mightiest monuments. Babylon, Tyre, and Palmyra have mouldered into dust; Baalbee is a fragment of decay; the Parthenon has been rent in twain; the Ephesian temple is in ashes; the Colosseum is only a wreck of its former grandeur, whilst the stupendous tomb of Cheops has defied both time and tempest.

The Cathay of our search continually glinted before us in the diamond sunlight, and, after many weary hours, we reached Gizeh. Mounting heavenward, though not on Jacob's ladder, to the top of stern and awe-inspiring Cheops or Suphis' pyramid, we looked down upon forty centuries of recorded history and the silence of ages. Around us was spread out one of the grandest panoramas from which the reflecting mind could rebuild the past, and which, even for the present beholder, has large elements of beauty. On the west, the Libyan desert, like a vast ocean ridged by sandy billows, was lost in the horizon; on the north was spread out the fruitful Delta, with

its many waters slowly winding to the sea ; on the east appeared the great city of Cairo, mosaiced with palaces and mosques flashing the sunlight from swelling dome and lofty minaret ; and on the south, dwarfed by distance to a silver thread, stretched the mighty Nile, guarded by the thirty pyramid sentinels of Abousir, Sakkarah and Dashoor, extending many miles along the margin of the desert.

The pyramids of Gizeh are probably the oldest monuments in the world, reaching beyond history into almost fabulous antiquity, estimated by some Egyptologists to be 6,000 years before Christ. The largest of these are called after their monarch builders, Cheops, Cephren, and Mycerrinus, or Suphis, Sephres, and Mencheres. From childhood all of us have been familiar with their general character; but few who have not seen them ever realize the magnitude of these mountains of stone. The base of Cheops would nearly cover two of our Washington Squares, and its height is more than double that of Trinity Church spire.\* Its contents measure 85,000,000 cubic feet of stone, enough to build 500 miles of ordinary house wall, or, in other words, a modern city. How this vast mass was piled up is called a miracle; but to the engineer, with money and labor, all things are possible. Herodotus says 100,000 men were constantly employed for ten years in preparing and transporting the materials, and twenty years in building Cheops. Exaggerated notions prevail with regard to the size and difficulty of handling the stones, of which I saw none weighing over twenty tons—playthings to modern machines.

The next question asked is : What object were these mountains of stone to subserve ? Pliny doubtless correctly answers when he says that they were "an idle and silly display of royal wealth." Perhaps, too, they were to keep employed a restless people addicted to communism. That they were built for astronomical purposes, when the smallest fraction of their cost would have better accomplished the same purpose, seems to me most preposterous. Lately I heard a learned lecturer, who was a better astronomer than an Egyptologist, try to prove that they were built to catch a ray from

\* The Pyramid of Cholula, Mexico, had four times the base, but only one-third the height of Cheops.

the polar star through one gallery, inclined about  $26^{\circ} 41'$ , and reflect it through another, in order that Cheops might be built in the exact latitude of  $30^{\circ}$  (that being the third of a right angle), and the faces of the pyramid be placed in true north and south and east and west lines. Unfortunately for this theory, the instrument—the pyramid itself—to be used in solving the problem, could not be *built* before it was accurately *located*; and when built, its galleries, less than four feet high, furnished no possible position from which to observe the polar star. Besides, to guard against the intrusion of astronomers or others, the galleries were hermetically sealed by a heavy stone portcullis within and the exterior granite casing without. Further, be it observed, that Cheops is not in the exact latitude of  $30^{\circ}$ , nor are the sides of the pyramid in true lines of latitude and longitude.

Another theory, which has been elaborated with great ingenuity by Professor C. Piazzi Smyth and other learned men, is, that the pyramids were built to preserve the "sacred cubit of Moses," or unit of measure for capacity, distance, weight and time. Unfortunately for this theory, it has not accomplished its purpose, the cubit among the ancients having varied with each country; and even the dimensions of the preserved cubit, or pyramid coffer, are still unknown, no two of the twenty-five measurements taken by savans from 1553 to 1837 agreeing with each other. Further, the pyramids were probably built long before the Hebrews occupied Egypt, and it is a singular circumstance that Moses should have failed to leave any account of what was deemed of sufficient importance to bestow thirty years of the toil of 100,000 men to preserve!

In the immediate vicinity of the Great Pyramids is the colossal Sphynx, with the body of a mighty lion and a monstrous human head (over 100 feet in circumference), symbolical of great physical strength and high intellectual power. Between its paws is a small chapel, now buried in the desert sands, in which the rites of religion were paid to kings and priests before embarking to Amenti, or the Shadow Land. Most of the Sphynx is cut out from an isolated ridge of limestone rock, and its magnitude is sufficient to fill the largest cathedral in this country.

We must now hurry up the Nile, for "Art is long and Time is

fleeting." Omitting much of interest and of personal adventure among the natives, crocodiles and wild beasts in the life-giving days during which we were enjoying a voluptuous reverie of nature, and our dahabéh was slowly winding its way to Central Egypt, we must stop a moment to look at the twenty-two grottoes or catacombs of Beni-Hassan, excavated in the solid calcareous rock during the reign of the great Osirtesen I. They are supposed to have been used as tombs by the people of Hermopolis, on the opposite bank of the river. Here are apartments 60 feet long and 40 feet wide, in which are two rows of columns of sixteen sides, slightly fluted, seeming to be the prototype of the Doric shaft. Surmounting these columns, which are 5. feet in diameter and nearly 17 high, are front and transverse entablatures with regular arches springing from the latter, which were unnecessary for supports, as the whole is cut out of the solid rock. Hence we infer that these grottoes were made in imitation of existing structures, or, in other words, that the arch was well known to the Egyptians thousands of years before our era, and is not an invention of the Romans, as claimed till within half a century. I have myself seen the arch principle in Cyclopean ruins, which go back beyond history. A profusion of paintings cover the ceilings and side-walls of these tombs, one of which by many is supposed to represent the journeying of Joseph's brethren through the land of Goshen.

We must now make another long leap to the well-preserved Temple of Dendera, over 200 feet long, dedicated to the Egyptian goddess Athor, the Greek Aphrodite, or Phœnician Astarte. Though this temple was built in the decline of Egyptian art, during the Ptolemaic period, its proportions and symmetry give it a pleasing effect, and many of its details are not devoid of beauty. In the reign of Tiberius Cæsar was added a noble portico of twenty-four heavy columns, in four rows, with capitals which are a composite of the Osiride and foliated styles. Between the first line of columns, on either side of the entrance, stretches a high stone screen ; on the ceiling is the zodiac, which has led to much learned controversy ; and on the architrave is a sculptured procession to Athor. On the back wall of the exterior of the temple is represented the celebrated Cleopatra, with her son by Julius Cæsar, but neither her features—except a full, eloquent and voluptuous mouth—nor her

figure correspond with her renowned beauty, which perhaps is due to defects of Egyptian art. Her portrait on her coins is that of a woman of intellect and charm, not of beauty. The smaller edifices about Dendera are hardly worthy of description.

Omitting an account of our "Battle of the Nile" at Esbe, opposite Dendera, which doubtless produced as profound a sensation among the natives as the operations of Cambyses or Alexander, we will pass on to "the hundred-gated Thebes," as sung by Homer, which it requires many days to traverse, and a volume would be necessary to recount its surpassing wonders. This famous abode of kings, regarded by the ancients as the oldest city of the world, existing before the Jews had become a people and the Greeks had an alphabet, occupied both banks of the Nile with an area of twenty-three square miles, or a greater extent than ancient Rome or modern Paris; upon an emergency could send to the field 600,000 foot soldiers and 27,000 chariots; and, until conquered and sacked by Cambyses, 525 B.C., gave evidence of an art gigantic in its dimensions, sublime in its beauty, and most admirable in its skill. Even now the proud capital of the Pharaohs, the glorious wreck of centuries, with its stupendous monuments, gorgeous mausoleums, Titan temples, stately palaces and mummied mountain sides, awe the beholder looking through the gaps of ruin upon its waste of desolation. There still stand these noble wrecks of the childhood of the ancient world, the dumb chronicles of ages, and the reckoning-roll of the rise and fall of nations.

The principal remains are the temples of Karnac and Luxor, on the eastern bank of the Nile, and, on the western, the Rameseum and the temples of Madinet Habou, of Gournou, and of Thothmes Amenophis, the latter two now almost vanished from the earth. Everything about these palace-temples, the dwellings of monarchs and shrines of gods, were of an enormous size and of surpassing grandeur, court succeeding court, chamber following chamber, halls winding to sanctuaries, till the eye is wearied with the mazy distance and the imagination is appalled with colossal columns, long avenues of sphinxes, towering pylons, huge gateways, vast roofs of solid masonry, prostrate walls, and foundations and fragments stretching far into the desert.

The greatest of all the Theban prodigies was doubtless the world-

renowned Karnac, an aggregation of temples, each sovereign, from Osirtesen I. to Rameses III., adding a pylon, a court or a colonnade to surpass his predecessor in magnificence and to link his name with eternity. This great temple, which no pen can adequately describe, antedates coherent history; required for its building a period equal to the whole Christian age of the world; has scorned time, earthquakes, the despoilers of Cambyses and the siege of Ptolemy Lathyrus; and yet stands a mighty wreck in ruinous perfection, the most magnificent architectural relic of which either the ancient or modern world can boast. This sacred palladium of Egypt stood on the edge of the desert, looking over more than a mile of verdure to the gently-flowing Nile, and was approached by avenues of huge ram-headed sphinxes, originally about 4,000, now broken and buried in the sands, seeming like gigantic fossils of a long-elapsed geological age. Karnac dates back to Osirtesen I., according to Mariette more than 5,000 years ago, and, with the additions of succeeding monarchs, presents a wondrous pile, 1,200 feet long, 370 broad and 80 high, adorned with gigantic colonnades, colossal figures and an almost endless panorama of pictures and sculptures. Entering the imposing western gateway, flanked by massive and lofty pylons on either side, we reach the fore-court, 279 feet in length and 330 feet broad, with a covered corridor on both sides and a double line of columns down the centre. Passing from the fore-court between two still more colossal pylons, we reach the majestic "Hall of Beauty," unsurpassed by anything in the ancient world. Its stone ceiling was supported by 134 columns, of which 12 in the two central rows are 35 feet in circumference and double that height; while the slightly smaller ones, in seven rows on either side, rise 42 feet, forming this matchless Assembly Hall, or great cathedral, with a pavement of 60,000 square feet, or nearly as large as the Murray Hill reservoir in New York. A third propylon closed the great hall on the eastern side, beyond which, and extending the entire width of the temple, was a narrow uncovered court, in which stood two highly-polished granite obelisks, nearly 100 feet high; and behind these was a fourth propylon, at which the true sanctuary, made of red granite, begins. Here, in labyrinthine complexity, are courts, chambers, chapels, colonnades, galleries and corridors, strangely intermingled.

The magnificent whole is a mighty mosaic of ruins, set in emerald verdure and bordered by the silver Nile. Attached or connected with the principal pile by avenues of statuary and sphinxes, were isolated monuments and minor shrines or sacred edifices. The great central Karnac temple, with its twenty-six attendant satellites of sanctuaries, was surrounded with a sacred enclosure of nearly two miles in circuit, and was entered by lofty portals, each the rival in size, not beauty, of the gigantic triumphal arch at the Barrière d'Étoile of Paris. Adorning this enclosure and the walls of the great interior temple were innumerable bas-reliefs, executed in the most finished and elegant style of Egyptian art, and delineating whole centuries of history, priestly and triumphal processions, kings making offerings to the gods, great battles and sieges, assemblages of conquering hosts with royal banners, and last, not least, the great Shishak's victorious expedition against Jerusalem, 962 B. C., in which were occupied or captured over 130 cities, here named.

Leaving this austere and dumb chronicle of silent ages, we passed from Karnac, along an avenue of a mile and a half of buried ram-headed sphinxes, to the temple of Luxor, another wilderness of ruin, now nearly covered with mud and sand, above which rose its broken fragments, leaning on each other as if weary with years. Its visible and most striking monuments are two sitting statues of Rameses II. and his queen, nearly forty feet high, buried breast-deep in débris, before which stood the celebrated red granite obelisks, one of which was removed to Paris to become the unintentional monument to Louis XVI., Marie Antoinette, and the other victims of the guillotine, which stood on the very spot in the Place de la Concorde where the obelisk is now erected.

Wrapped in contemplation before buried Luxor, I noticed one noble temple-column just peering above the Theban plain. Upon its widespread capital rested an Arab's hut, with his whole herd of goats pasturing within its margin. Such is the difference between the Titan grandeur of ancient and the pigmy proportions of the modern Egyptian civilization.

The limits of this paper utterly forbid any detailed description of the majestic remains of the temples and palaces on the left bank of the Nile, where mouldering heaps and piled-up fragments cast their

deep shadows on every step of the traveler. This western part of Thebes seems chiefly to have consisted of magnificent buildings rising in terraces from the river's bank, each with each connected by grand flights of steps and avenues of colossal sphynxes. This formed a striking Acropolis-like approach to the vast Necropolis of the city, consisting of tiers upon tiers of catacombs and gorgeous mausoleums of kings, queens, priests, citizens and animals, the whole hewn out of solid rock, and covering miles of the mountain sides of the Theban valley. At least two millions of human bodies, embalmed in the rust of centuries, lie buried in these Lybian hills.

In one of the west bank temples, the Rameseum, improperly called by Strabo the Memnonium, which for symmetry of architecture and elegance of sculpture may vie with the proudest structures of the Pharaohs, is the stupendous syenite statue of Rameses, seated upon a throne. It must have weighed nearly 1,000 tons before Cambyses shattered it into many fragments, any one of which would require the most powerful modern machinery to handle.

In this vicinity are the two celebrated colossal monolith sitting statues, 60 feet high and 18 across the shoulders, which for thirty-three centuries have calmly watched, like giant sentinels of conscious power, o'er the Theban plain. One, the vocal Memnon, is a petrified melody to the meditative mind of every poetic beholder, as he unconsciously turns his ear towards the Syren of the Dawn, the fabled Son of Aurora. So deeply was I impressed with the beauty of this time-venerated myth that, on the last morning before leaving sacred Thebes, probably for ever, I determined to visit Memnon at sunrise, there in imagination to realize its magic music. As the statue was miles from our boat, we ordered horses the night before to be early at hand. Every eye bent o'er the break of day, which glimmered in the east, but no horses had arrived, and, as the reddening sky glowed brighter, our impatience knew no bounds, when at last our long expected quadrupeds arrived. Instantly in the saddle, we ran a break-neck race with Phœbus' chariot, and fortunately reached the statue just as the sun rose in the crystal sky, in all his majesty, o'er the Arabian mountains, and his horizontal rays burnished with gold the Lybian hills. A moment more and the brow of Memnon was in a blaze of light, when quickly came from that stony statue notes of delicious music, and a moment later I heard

the croaking sound of the uttered oracle. Wild with delight, I intently gazed upward and beheld a lovely little bird perched in a crevice of Memnon's shattered neck, warbling its matin melody, and a hawk, which had lighted on the head of the statue to seize its prey, articulated a few hoarse notes, to me sweeter than any heathen oracle, for it was the answering voice of the god of light, Horus (Apollo) being always symbolised in the Egyptian mythology as hawk-headed.

Leaving behind us our lovely morning dream, we wended our way through the dazzling desert defile to the Theban Necropolis, from which come odors of myrrh, cassia and sweet spices designed to cheat of corruption dead kings embalmed in rock-ribbed tombs, there awaiting in fancied security the return of the soul, little dreaming of any disturbance of their mummied sleep ; that "No" should be rent asunder and Jeremiah's prophecy be fulfilled—"I will punish the multitude of No, and Pharaoh, and Egypt, with their gods and their kings, even Pharaoh, and all them that trust in him."

It would require volumes to adequately describe the thousands upon thousands of the tombs of Thebes ; we must, therefore, limit ourselves to giving an outline of one or two of the most prominent of nearly fifty royal mausoleums having the same general plan. Belzoni's, so called after its discoverer, is by far the most remarkable for its sculptures and state of preservation. This catacomb is a succession of courts, halls, chambers, corridors and galleries, the columns, walls and ceilings being covered with a profusion of hieroglyphs, sculptures and frescoes, fresh as if painted but yesterday. These delineate Egyptian rites, sacrifices and ceremonies ; kings, queens, genii and gods in every stately office; processions of different races, each having a distinctive color; and even representations of beautiful allegories and celestial visions. The entire length of this grotto is nearly 400 feet, and descends, by successive flights of steps, 180 feet into the solid calcareous rock,—all to entomb the embalmed monarch Osirei, or Seti I., in an alabaster sarcophagus, with its accompanying vases of golden ornaments and rare jewels. Of nearly equal extent and magnificence is Bruce's, or the Harper's Tomb; but we must pass it by, as also those of many of noted Pharaohs and Ptolemies. Suffice it to say, that in this vast, desolate abode of death the catacombs are of all forms, dimensions and ornamenta-

tion ; one of the royal scribe, Petamenap, being 862 feet in length, and, including its various courts, halls and chambers, has an area of more than half an acre of rock excavation.

"Crypt tangles crypt,—a perfect network weaves  
This gloomy labyrinth of horrid caves."

The mighty Thebes, the time-silvered patriarch of twelve centuries before Troy fell and thirteen before Baalbec rose, has so long occupied us that we must now leave its aspiring obelisks, cyclopean monoliths and vast forests of columns, which seemed like groves of palm-trees blossoming in stone. Leaving behind us "the City of Thrones," we were again ascending the sacred Nile ; but a lingering gaze yet rested upon the fading fragments of the Rameseum, the changing beauty of Luxor, the vanishing Lybian hills honeycombed with sepulchres, the misty Memnon still turned to the coming dawn, and receding Karnac yet triumphant in its grandeur.

We must pass over Esnē, with its dancing Gawasees, which is not high art, their feet never being lifted from the floor; the imposing but unpicturesque temple of Edfoo, where the winged-globe was deified, where the Virgin Mary was worshiped by the Athanasian monks, and upon whose ample roof stood a whole Arab village ; the ruins of Kom Ombos, where high honors were paid to the crocodile; the famous "Mountain of the Chain"—Hager Silsileh—from whose extensive quarries came nearly all of the sandstone for the great edifices of Egypt ; the more precious granite deposits of Assouan, the Syene of the Scriptures, and Juvenal's abode of banishment; and Elephantine, or "Isle of Flowers," where was a temple, and the great Nilometer which measured the flow of the nursing mother of Egypt.

This brings us to the first cataract, where, in some awful convulsion of nature, the Nile burst from its Nubian bounds to invade the plains of Egypt. Just above the cataract is the Island of Philae, a garden of the Hesperides to the ancients, no less interesting from the character of its sacred edifices than for the general effect of its picturesque ruins. It seems wonderful that this lovely "Isle of the Blest"—a precious emerald set in the sapphire Nile—should be surrounded by such incongruous elements : the roaring angry cataract, turbid with the desert sands below ; the wild desolation of the Nubian cliffs above ; and, on either side, porphyry rocks and basaltic

dykes inextricably piled into vast ridges and stupendous peaks by the earthquake's play and for the volcano's sport. This was the holy island of the ancients, dedicated to the great Osiris, the god of gods in their theocracy. To this Mecca of the Pharaohs came priestly processions; Magi, bearing from the plains of Shinar their richest gifts; philosophers to read "sermons in stone;" and, here, princes and kings kneeled uncrowned at the shrines of the vanished splendor of a vanished race.

It would be an endless task to give a detailed account of all that here interests the inquisitive antiquarian and curious traveler, where, says Pythagoras, the resurrection of Osiris opened the way 2,000 B. C. for the doctrine of the immortality of the soul, and where, in the days when the Saviour of mankind rose from the dead, Plutarch wrote his treatise on Isis and Osiris under its sylvan shades. Suffice it to say that, among the well-preserved ruins of Philae, are the Chapels of Esculapius and Athor, the so-called "Bed of Pharaoh," and the noble Temple of Isis, the goddess whose single tear gave an inundation of the Nile and blessings to all Egypt. This latter edifice, erected on the site of a former Pharaonic temple, was a Ptolemaic structure, upon which were Roman inscriptions. Many of its parts, particularly the portico, are remarkable for lightness and elegance, though not so simple and chaste in style as some of the older monuments. The "Bed of Pharaoh," on the east, is an hypetheral temple of the times of the Ptolemies and Cæsars. Rising above all the other ruins and boldly standing out, its whole effect is very striking. Its heavy columns are half concealed below by screens or gateways between each pair, and upon their richly foliated capitals are square pillars supporting a bold, continuous entablature. The novel style of its vertical proportions gives it a very peculiar character, differing from any known types of Egyptian, Greek, or Roman architecture.

We have written far more than we designed, but we cannot dismiss the Land of the Pharaohs, Ptolemies and Cæsars, without a few general remarks upon Egyptian art.

Egyptian drawing usually consists in a stiff profile outline of little grace, and the painting was simply the filling-in of these, according to conventional rules prescribed by the priesthood, with some monotonous flat tint of bright color, producing no relief and rarely

any aerial or other perspective. The human family were generally painted red, animals brown, birds blue and yellow, and other objects as decreed, in utter disregard of all actual appearance. Like all primitive art, the Egyptian was commemorative of great personages and, subsequently, was applied profusely to a multitude of domestic, historic and mythological subjects, expressed, ordinarily, in grotesque forms of an almost uniform type, quite as pleasing to the fashionable taste as the modern pottery figures of the "Heathen Chinee." The Egyptians, even in their palmiest days of art, 1400-500 B. C., had little conception of composition in the present high sense of the term, and landscape imitations of nature were totally unknown to them. They never portrayed emotions beyond an inane simper of pleasure or of satisfaction in trampling upon a prostrate foe; ideality rarely tinged their pencils, but there was a pervading expression of repose in their delineaments worthy of the later school of painting.

In sculpture, the oldest statues in existence are Egyptian—4449 B. C. The famous cedar-wood statue of a sheik, found by Mariette at Sakkarah and now in the Boolah museum, shows more realistic tendency, is modeled more after nature and is pervaded with a higher sense of life than those of a later date, which were subjected to the inanition and formalism of hieratic ideas. Life has rarely ever been better rendered than in the genial, benevolent face and graceful, easy pose of this life-like sheik. After the date of this statue, 3951 B. C., there came a long period of confusion, up to the time of the Middle Empire, about 3,000 B. C. Here, in Theban Egypt, art was purely sacerdotal, the human form being delineated much like a colored silhouette, or sculptured with the grace of a petrified mummy. Statues of gods and kings had the same imposed attitude and wore the same stereotyped aspect of calm beatitude, with passionless features and passive repose, like corpses laid out for burial; for the law of life was immutability, without aspiration, without hope, with no desire of change, and an equal fixity after death. The priests dictated everything, hence there was a despotic monotony of ideas, the same symbolic attributes, a dead formalism devoid of power, which allowed little scope for imaginative treatment or intellectual individuality. Consequently there were no distinctive schools of Egyptian sculpture, no nice differences as in

Greece to stamp a Phidias or Praxitiles. Strange to say, the Egyptians were more successful in the delineation of the lower animals than in that of the human figure, which always had fixed arithmetical proportions, its greatness being in colossal magnitude, not in intellectual preëminence, as sculpture followed the necessities of their architecture, to which it was always subordinated. Herodotus tells us that whenever a house was on fire, the chief care of the neighbors was to save the cats. The men and women might be burned in the ruins, but the cats must be saved at all risk. When a cat died a natural death, all the inmates of the house shaved their eyebrows, and when a dog died they shaved all over. Death was the penalty for killing any sacred animal or bird, as a hawk or ibis.

In the bas-reliefs there is the same formalism, the same crudity and the same lack of true artistic feeling; no idea of composition in the decorations illustrative of the daily life and industries of the people, where one huge figure predominates over all others in the group, as in the battle-scenes, in which the victor in his mammoth bulk o'erlops the highest city or castle-walls, and with his drawn sword is about to decapitate, at a single blow, whole scores of captives held by the hair in the left hand of the slayer. Every vocation is alike represented with the same stiff, motionless aspect and posture, without any more regard to anatomy than exists in a wooden puppet or a child's china doll.

We have dwelt so much upon the pyramids, tombs, palaces and temples, which form the gallery of art and history in Egypt, that we shall say little more of its architecture, in which a spirit of simplicity, grandeur and solidity predominates, every precaution being taken to render them eternal. Religion was the chief incentive to architecture which built the temple, and to sculpture which fashioned the indwelling god. Hence its stupendous proportions to fit it to the might and majesty of its presiding deity, and to appal its worshipers with a sense of their own nothingness. Moral ideas, by priestly domination and the exhibition of physical forces, thus engendered in the credulous Egyptians a belief in the supreme power of the gods, of whom, Herodotus tells us, they "surpassed all men in their worship." In the perpetual conflict between the Nile and the Desert they saw their pre-eminent deity, Osiris, rise from his bed in Philae to scatter blessings o'er the land and

bring the fertilising waters from an unknown and mysterious source; while Typhon, the eternal foe to the benificent Nile, was the storm god whose fiery breath brought only the burning blasts of the desert. The annual triumph in the river's inundation of the good god over the monstrous spirit of evil, who instantly vanished to the silent depths of the Lybian sands, profoundly impressed a superstitious people, calling forth all their energies, which long preserved them from that enervating spirit of luxury and indolence to which the downfall of so many nations may be traced, while, at the same time, it awoke within them an awful sense of the impotence of man and the power of the Supreme Ruler of the universe. Next to the gods were revered the rulers of the people, whose high ambition it was to maintain their ascendancy and hold the present and succeeding generations captive by stupendous sanctuaries, of which their chief builders were those renowned Pharaohs, Osirtesen I., Thothmes III., Seti I. and Remeses II. These superëminent sovereigns of Egypt, rich with the spoils of Asia and Africa, and having at their command captive thousands, determined to build up Thebes to be the capital of the world, the centre of civilization, and to make the creators of its temples worthy of places in the hierarchy of heaven. They, in doing all this, knew as skilled artists that Egypt, without mountains and valleys, must have the monotony of its unvarying plain made picturesque by sky-piercing obelisks, enormous statues, and awe-inspiring palaces and temples. Such stern sublimity nowhere exists as in Egypt; and life's solemnity and death's preparation for immortality is attested by every pyramid, temple, catacomb and mortuary monument, be they structures of early Asiatics, later Egyptians, conquering Greeks, or subjugating Romans, which stand like milestones of history over the land. From Alexandria, where tradition points to the tomb of the great Macedonian monarch, to far-distant Philæ, where Osiris, the chiefest god of the Egyptians, lies buried, the Nile is truly the Valley and Shadow of Death, and the murmuring stream, from the roaring cataract to the silent sea, chants an eternal requiem to the dead of an hundred centuries!

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## EGYPT

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THE RECENT INVESTIGATIONS OF THE GULF STREAM  
BY THE U. S. COAST AND GEODETIC  
STEAMER "BLAKE."

BY

COMMANDER JOHN R. BARTLETT, U. S. NAVY, ASSISTANT IN THE COAST  
AND GEODETIC SURVEY.

I consider it a great honor to be connected in any way with the investigation of this great river of the ocean, and it will give me pleasure to lay before the Society any new facts that I have obtained, under the direction of Mr. Patterson, the present Superintendent of the Coast and Geodetic Survey.

To the United States Coast Survey, first organized by Mr. Hassler, and especially to the systematic examination instituted by Professor Bache, are we indebted for most of our knowledge of the Gulf Stream, a knowledge which has been of inestimable value to the mariner.

The investigations begun by Dr. Franklin, and pursued by his descendant Professor Bache, have been continued by Prof. Peirce and Mr. Patterson, but by none with more earnestness than by the present Superintendent, who has the advantage of the more modern and improved instruments. Mr. Patterson kindly gave me permission to use the data obtained by the steamer *Blake*, in preparing my paper. The Coast Survey deals only in facts, and the superintendent told me that any theories advanced, must be my own. I shall, however, present you the facts and leave you to draw the conclusions.

The facts obtained by the steamer *Blake*, regard: depths, temperatures from surface to bottom, character of bottom, specimens of water for analysis from surface to bottom, surface and under currents, and animal life from surface to bottom, especially at the latter.

Many of my hearers have probably read more than I on the subject of the Gulf Stream, and some have listened to papers by our most learned and scientific men in relation to its origin, course and

temperature. A very interesting article appeared in the *Galaxy* from the pen of your own Dr. Hayes. Every one has read Lieutenant Maury's entertaining chapter on the Gulf Stream, in his "Physical Geography of the Sea;" but his theory of its source is generally disputed. He says the brine of the ocean is the lye of the earth; and that from it the sea derives dynamical power and its currents their main strength. He traces all ocean currents to differences in specific gravity.

It is its source of which I wish first to speak, in order to lead up to the point at which I hope to be able to give some new data. I will not enter into a lengthened discussion, but I wish to assume that the equatorial current is the source of the Gulf Stream, and I only quote a few words from the best authorities on the subject.

Sir John Herschel says: "The dynamics of the Gulf Stream have of late, in the work of Lieutenant Maury, been made the subject of much (we cannot but think misplaced) wonder, as if there could be any possible ground for doubting that it owes its origin entirely to the trade winds."

Sir C. Wyville Thomson has some very interesting remarks on the Gulf Stream in his recent work, "The Depths of the Sea," and comes to the conclusion that it is the reflux of the great equatorial current.

Humboldt attributes the origin of this current to the trade winds, and lays the first impulse and origin of the Gulf Stream south of the Cape of Good Hope.

There is no doubt about the equatorial current. Columbus wrote in his journal: "I regard it as proved that the waters of the sea move from east to west as do the heavens."

I would liken this great equatorial current to the heart in the human body, supplying the Gulf Stream with fluid as through the arteries, the water finding its way back naturally by the polar and colder currents or veins, to its original source. This action goes on in the Pacific as well as in our own Atlantic. The life or moving power is, as Herschel says, the trade winds, and this force is derived from the sun. Professor Bache, in his paper on the Gulf Stream, says: "The great part which the heat of the sun plays in disturbing the equilibrium of the surface of our globe is well understood. Wherever he shines upon the surface, the air resting upon it is set

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in motion, so that the circle of the sun's illumination, as it advances over the earth, is a circle of disturbance."

An article in the *American Cyclopedia*, based on Coast Survey reports and Professor Bache's paper, says: "The equatorial current, that volume of water moving from east to west on our globe, interrupted by continents, and sending off branches in other directions, again to reunite, may be said to commence, or, more properly, reappear on the west coast of Africa. The action of the trade winds, which blow constantly between the tropics, is the cause of this current, and, without doubt, its velocity is increased by the rotation of the earth on its axis. Flowing on both sides of the equator in longitude 30° W., its breadth is estimated at 300 miles. Here it divides, the southern branch forming the Brazil current, the remainder flowing on to supply the Gulf Stream."

It is said to flow through the Caribbean sea to the Gulf of Mexico. It will be my purpose to show its course from the time we meet it to the eastward of the Windward Islands until it enters the Gulf of Mexico at the Yucatan passage. It is said that, at times, the water flows through this passage from 27 to 50 miles in 24 hours. Near Yucatan, we found it in the month of May flowing at the rate of three miles an hour. From this point the course of the current is generally described as making the tour of the Gulf of Mexico, or following around its boundary, before passing out at the Straits of Florida. This is disputed now, with, I think, very good reason. The investigations made by the Coast Survey carry the current passing through the Yucatan passage well to the northward, where the waters are banked up by the pressure, and thus form a head or reservoir for the current, which flows from a point south of the mouth of the Mississippi direct to the Straits of Florida.

South of Tortugas, the stream flows to the eastward, gradually increasing its velocity as it moves on. Opposite Havana, where its breadth is about 70 miles, its average rate is said to be two miles an hour in the centre, decreasing on each side; northwest from Elbow Key, where its breadth is about 47 miles, the set, in the centre, is said to be northeast three miles an hour, with an increased rate toward the Florida reefs. The stream now bends to the northward, and, in the straits between Cape Florida and the Bemini Islands, its

velocity is said to vary from one-half mile to even five miles an hour. This is the narrowest part of the stream, and I find it stated that its maximum temperature is  $85^{\circ}$ . The season of the year when it reaches this maximum is not given. I will speak of this part of the stream later on, and will mention the date when giving temperatures or currents observed by the *Blake*.

In November, 1878, I was ordered to report to the Secretary of the Treasury for duty on the Coast and Geodetic Survey, and was assigned by Mr. Patterson, the superintendent of that service, to the command of the steamer *Blake*. My instructions for the first season's work, after the dredging for Mr. Agassiz had been completed, were as follows:

"You will please take soundings in the passages between all the islands from Trinidad to Cuba, not already sufficiently sounded, for the purpose of determining the ridge of least depth of water traversing these passages. Temperatures from surface to a depth of 100 fathoms, and at the bottom, should be obtained as often as opportunities offer, and serial temperatures, from surface to bottom, between the islands and on each side of the shoalest ridge."

It will be seen by these instructions that it was Mr. Patterson's idea to find the amount of water which enters the Caribbean sea between the Windward Islands, and, what was more important than anything else, to observe carefully the temperature of the water at different depths, as these temperatures would give the most interesting data in reference to the circulation.

As Mr. Patterson says in his report: "The discovery by the *Challenger* of submarine lakes, whose temperatures are constant to the greatest depth with that of the ocean at the depth of their rims, rendered it more than ever imperative to determine the depth of the rims separating the waters of the Gulf of Mexico from those of the Caribbean, and its waters from those of the Atlantic, both to the eastward and westward."

As it was very important to connect the fauna of the West Indies with the Arctic fauna, and as naval officers are professionally neither naturalists nor geologists, Mr. Patterson sought the services of Mr. Alexander Agassiz, who consented to take charge of the special work, naming the localities to be dredged over, and taking care of the life obtained. Professor Agassiz joined the *Blake*

with an assistant, and the first part of the season's work, until March 10th, 1879, was occupied in dredging and trawling under the lee of the Windward Islands. We met with great success in this very interesting work; but this part belongs more especially to Professor Agassiz, who will, in due time, present a popular account of the results of his labors. As the working of the dredge and trawl was done by the officers and crew under my command, I will, if time permits, give some account of our appliances.

Besides dredging under the lee of the islands, we made a number of soundings and hauls to the southward of Grenada, enough to develop the channel between that island and Trinidad. The greatest depth was 421 fathoms in a channel 30 miles wide; temperature at bottom,  $41\frac{1}{2}^{\circ}$ . We were here the latter part of February, and found the current very strong to the westward. It is stated by a number of authorities, and published as the observation of the English surveyors, that a strong current is felt all along the Spanish Main a few miles from the coast.

In making the passage from St. Vincent to Barbadoes in the first week in March, we experienced a current of about 40 miles in 24 hours setting to the northward, and from enquiry on board English men-of-war and merchant vessels at that time in port, I found they had experienced the same northerly current. I crossed this passage again, in the latter part of March and in the middle of April, finding the same current.

Our method of finding the ridge connecting any two islands, was by running traverses, or a line of soundings begun in deep water and carried at right angles to a line drawn between the islands. The soundings would gradually shoal to a minimum and then increase, when a new line of soundings was run across the ridge at such an angle as to bring the soundings at the shoalest point about four or five miles apart. At every sounding the temperature of the surface was observed, as well as the bottom. I have spoken of the passage to the southward of Grenada. Our first sounding and temperature work was between St. Vincent and St. Lucia. A connecting ridge was found between these islands having a greatest depth of 488 fathoms, a bottom temperature of  $41\frac{1}{2}^{\circ}$ . The soundings across were 488, 370, 198, 171, 129, 164 fathoms.

It will be seen by the contour lines that the water deepened

gradually to the Atlantic and quite abruptly into the Caribbean sea. Traverses were run between all the islands as far as the Virgin islands, with the following depths: Between St. Lucia and Martinique, 548 fathoms, temperature  $41^{\circ}$ ; between Martinique and Dominica, 575 fathoms, temperature  $41^{\circ}$ ; between Dominica and Guadalupe, 346 fathoms, temperature  $44\frac{1}{2}^{\circ}$ ; between Guadalupe, Antigua and Nevis, 386 fathoms, temperature  $45^{\circ}$ ; between Anguilla, Sombrero and Anegada, 1,100 fathoms, temperature  $38^{\circ}$  on the ridge, but this latter sounding was in a canyon, not more than two miles wide, and on each side of it were only a few hundred fathoms. Between Anegada and Sombrero, we found, outside of the ridge, a temperature of  $38^{\circ}$  at 1,346 fathoms,  $37\frac{1}{2}^{\circ}$  at 1,643 fathoms, and  $36\frac{1}{2}^{\circ}$  at 2,558 fathoms. The lowest temperature that was found inside was between St. Thomas and St. Croix, that of  $38^{\circ}$  in 2,470 fathoms. To the southward of St. Croix, inside of the islands, the temperature of all depths below 800 fathoms was  $39^{\circ}$  to  $39\frac{1}{2}^{\circ}$ , and it was only in the deep hole north of St. Croix that we found anything lower. It will be seen by the contour lines that the deep water was traced in a channel from Anegada passage to a line between St. Thomas and the west end of St. Croix. The temperature at 1,542, 1,517, and 1,508 fathoms, south of Mona passage, was only  $39\frac{1}{2}^{\circ}$ , which would seem to indicate a connecting rim from St. Croix to the northward, cutting off the cold water that was found between St. Thomas and St. Croix.

In every passage a series of temperatures, or serial, was taken to the eastward of the ridge, then directly on the ridge, and again in the Caribbean sea. The depths for a serial were: surface, 2, 10, 25, 50, 75, 100, 150, 200, 300, and so on at each hundred fathoms. The temperature at the bottom for the same depth remained constant in the same locality; by comparison, these agreed with the same depth obtained in a serial. At Barbadoes, St. Lucia and Martinique the temperatures were at 100 fathoms  $56\frac{1}{2}^{\circ}$ ; 200 fms.,  $51^{\circ}$ ; 300 fms.,  $45^{\circ}$ ; 400 fms.,  $43^{\circ}$ ; 500 fms.,  $41\frac{1}{2}^{\circ}$ ; 600 fms.,  $40\frac{1}{2}^{\circ}$ ; 700 fms.,  $40^{\circ}$ ; 800 fms.,  $39\frac{1}{2}^{\circ}$ .

Just north of Guadalupe the temperatures suddenly increased. and at Monserrat were: 100 fms.,  $67^{\circ}$ ; 200 fms.,  $57^{\circ}$ ; 300 fms.,  $48^{\circ}$ ; 400 fms.,  $45^{\circ}$ ; 500 fms.,  $42^{\circ}$ ; 600 fms.,  $41^{\circ}$ ; 700 fms.,  $40^{\circ}$ . There was a slight increase as we neared the Anegada passage. These

temperatures remained the same to the Mona and Windward passages, and were carried through the Western Caribbean. The temperatures in the Windward passage in May were: 100 fms., 68°; 200 fms., 61°; 300 fms., 53°; 400 fms., 47°; 500 fms., 43°; 600 fms., 41°; 700 fms., 40°; 800 fms., 39½°. The temperatures between Haiti and Jamaica were not quite as high.

In February the surface was several degrees lower than in May, but the temperature at 100, 200 and 300 fathoms were the same at the Windward passage.

Between some of the islands we were five and six days in completing the development of the ridge. The trades blew almost a gale during the months of January, February and March, hence it was very tedious work; the small vessel of only 320 tons pitching her bows under, while the greatest care had to be exercised by the officer in charge of the sounding to prevent an accident to the wire. We worked during daylight, locating the position of the soundings by bearings taken on points of the islands, at night heading to the wind and sea under just enough way to keep in our place. While at work among these islands I wrote to Mr. Patterson: "The water does not set into the Caribbean sea through the passages between the islands to any great extent. The trades bank the water against the windward side of the islands, and near their ends the current sets strong to the westward, but we did not find the strong current in mid channel."

In the passages between the Windward islands we saw large quantities of the sea or gulf-weed. In the latter part of April we had calm weather north of Guadalupe, and I have seen this weed extend for miles in lines always pointing north. This was not owing to the wind, for at the time I speak of it was a dead calm, but seemed to be caused by the current flowing between the islands, which agrees with our observations of the direction of the current. Especially was this the case north of Guadalupe and near St. Christopher and Saba islands. Again, in the Anegada passage I saw the same string of gulf-weed stretching in lines to the northward.

There was a great deal of gulf-weed north of St. Domingo the 1st of May, passing through the Windward passage and south of Cuba; but I saw none south of Jamaica or over the Pedro and

Rosalind banks in the same month, nor did I notice the presence of this weed in the latter locality in January, February, March and April of 1880.

I was very much puzzled over a current experienced on the passage from Kingston, Jamaica, to St. Thomas, in the latter part of December, 1879. The trades were very strong from the eastward, but we had an easterly current of nearly two knots against wind and sea as far as the Mona passage, and a knot to St. Thomas. The captain of an English telegraph steamer whom I met at St. Thomas, who had been three years in the waters in question, stated that he had always found the current setting to the eastward; and I was given the same current by a number of English men-of-war. No dates were given. It is marked on the chart that the current sets to the eastward during the full and change of the moon.

North of Guadaloupe, by observation and dead reckoning, we found the current northerly in the latter part of April; after leaving Saba island the current was N.N.W., about a mile per hour; on our way from St. Christopher to St. Thomas we had a current of one mile per hour setting to the eastward in the same month.

The temperature of the surface water from Barbadoes to the Windward passage was from  $79^{\circ}$  to  $80^{\circ}$ ; in calm weather, in the day-time, it would rise as high as  $81^{\circ}$ . This was from March at Barbadoes to May in the Windward passage. In January, 1880, we found the temperature of the surface water in the old Bahama channel and at the Windward passage only  $76^{\circ}$ . This gradually increased, as we went to the westward and the season advanced, to  $78^{\circ}$ ,  $79^{\circ}$  and  $80^{\circ}$  near the Caymans in March, and to  $81^{\circ}$  and even  $82^{\circ}$  in May between the Misteriosa bank and the Yucatan passage. Over the Pedro and Rosalind banks, and north of the Mosquito coast, it was  $79^{\circ}$  and  $79\frac{1}{2}^{\circ}$  in February and March.

The bottom obtained in the soundings directly on the ridges was generally coral sand and dead coral; on each side, in the deeper water, it was pteropod ooze. As I shall speak so often of this ooze, I may as well describe it now. After reaching a depth of four or five hundred fathoms, we always brought up a light brown or coffee-and-milk colored paste. This paste is formed of innumerable pteropod shells. The pteropod belongs to the division of mollusca, and is characterized by having broad fleshy wing-like appendages or organs of

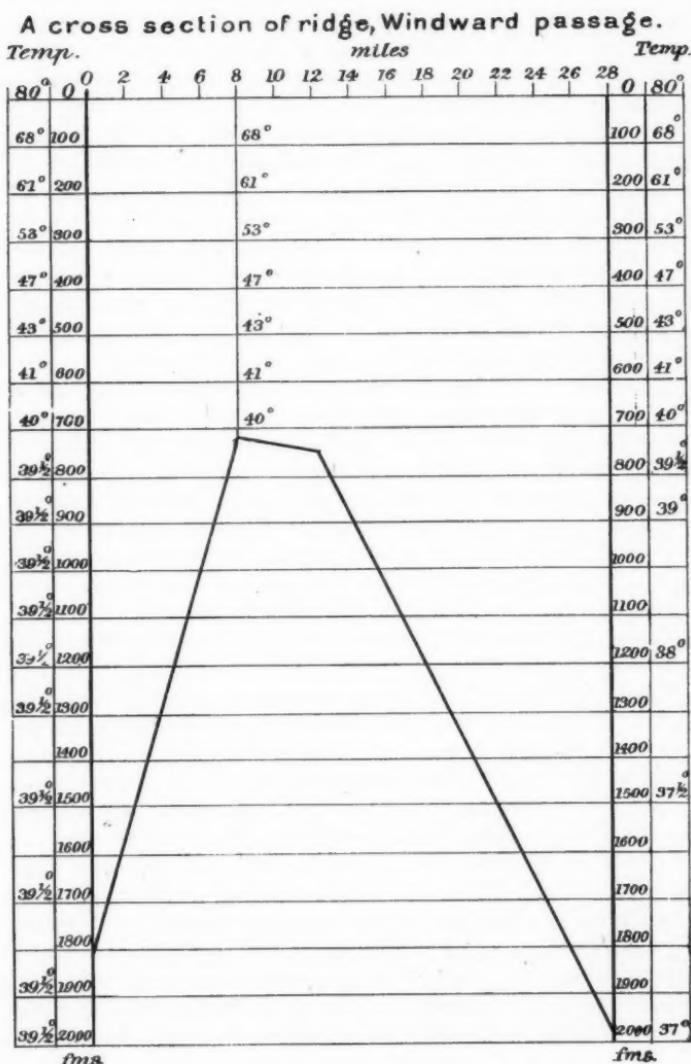
motion. The shell is transparent and very beautiful. This form of life lives at the surface, and when the animal dies the shell sinks to the bottom, and there decomposes and forms the paste or ooze spoken of. In sifting the ooze collected in the trawl, we found a great many whole pteropod shells.

The Mona passage was thoroughly sounded, and the greatest depth was found to be only 260 fathoms; the islands of St. Domingo and Porto Rico being connected by a plateau of like character with Porto Rico.

It will be seen by the soundings from Grenada northward, that the connecting ridges have the same character of mountain and valley as the lands which they connect. Between Martinique and Guadalupe, we found a peak in mid channel with only 40 fathoms, deepening on all sides to several hundred.

The bottom in the Mona passage was very hard, and no specimens were obtained. The surface of the connecting ridge seemed swept of everything. The wind was very strong while we were at work here, and the current west of Porto Rico set to the southward near the island, but at the west side of the passage the current set to the northward; this was in May. From the Mona passage soundings were taken every 20 miles, on the way to the Windward passage, north of St. Domingo. The depth averages over 2,000 fathoms with a bottom temperature of  $36\frac{1}{2}$ ° to 37°. There was a light easterly breeze here, and we found the current to the westward at the rate of 1½ knots per hour.

A very good profile was made of the ridge connecting Cuba with Haiti the first season, and this was verified and many new soundings were added last winter. The deepest water on the ridge was less than 800 fathoms. The temperature at 700 fathoms was 40°; below 700 fathoms,  $39\frac{1}{2}$ °; and the same temperature was always found at all depths below 700 fathoms in the Western Caribbean by the *Blake* while under my command, and by Lieutenant-Commander Sigsbee in the same vessel in the Gulf of Mexico. The temperatures outside of the ridge at this passage were: 800 fathoms, 39°; 1,000 fathoms,  $38\frac{1}{2}$ °; 1,200 fathoms, 38°; 1,500 fathoms,  $37\frac{1}{2}$ °; 2,000 fathoms, 37°. Inside of the ridge the temperature was constant at  $39\frac{1}{2}$ ° from 750 fathoms to 1,900 fathoms, 10 miles inside the ridge, and to 3,000 fathoms farther on. The first season



we were not able to get any specimens on the ridge at the Windward passage with the sounding cylinder, except a few small stones. The moment we crossed the immediate ridge on either side, the bottom was pteropod ooze. Last winter I made two hauls of the dredge in 700 fathoms directly on the ridge. The dredge brought up a quantity of hard coral rock or crust torn from the bottom. It had very much the appearance of old mortar, and was similar to the coral rock found on the northwestern end of Haiti, this part of the island being of coral to the very tops of the mountains. The southwestern end of the island is of volcanic formation, and is covered with luxuriant foliage, but at St. Nicholas Mole it is barren. The land, as seen from the sea, lies in terraces. Barbadoes is of similar formation in terraces to 300 feet above the sea, and all coral.

The second haul of the dredge was near Cape Maysi, still in 700 fathoms. The same bottom was found, also hundreds of shells of the "Scalpellum regium" (a kind of barnacle), which is described by Sir C. Wyville Thomson in his "Voyage of the *Challenger*." These shells were black and looked very old.

A few very small sponges and sea-urchins were brought up, but everything that could be swept away by a current was wanting. As I remarked before, all the ooze brought up, when sifted in water, was found to contain many whole pteropod shells, but my attention was particularly drawn to the fact that south of the ridge the ooze contained many more whole shells than that obtained to the northward. The current must have swept them off the ridge. While sounding between Miraporvos island and Cay Verde, in 1,400 fathoms, the sounding cylinder came up literally packed with these shells. The current in which they were suspended is here retarded by the Bahama banks, and they fall in this eddy; of course they must be falling everywhere, but here they seemed in excess of any other place. The old Bahama channel was thoroughly sounded by the *Blake*, the least depth being abreast of Paradon light, 284 fathoms; 500 fathoms abreast Lobos Cay light (this depth was taken over a sounding marked on the chart 900 fathoms, no bottom). A great many soundings were taken between Jamaica and the southwest end of Haiti, the result being the development of a narrow channel connecting the waters of the main Caribbean with the waters north of Jamaica. This channel runs close to Haiti,

with a greatest depth of 1,200 fathoms, the bottom temperature  $39\frac{1}{2}^{\circ}$ , and a general depth of 1,000 fathoms. The bottom everywhere was ooze. South of Navassa we found a large bed of the pteropod shells. The course of this channel is northerly along the western end of Haiti, where it does not exceed a width of five or six miles, thence westerly south of Navassa island, with a tongue to the northward and another to the westward between Formigas bank and Jamaica. We were here in the latter part of January, spending some ten days. We always found the current setting to the eastward, from one-half to one knot per hour. We met the English squadron at Port Royal, and I examined the logs of various vessels; all had found the same current setting to the eastward as far as the Mona passage. Jamaica was connected by soundings and serial temperatures with the Mosquito coast *via* the Pedro and Rosalind banks. The depths between Jamaica and the Pedro bank were: from Jamaica, 322, 320, 293, 236, 381 and 447 fathoms, the temperature of the latter sounding being  $44\frac{1}{2}^{\circ}$ . My map was too small to draw the 500 fathoms curve, but the water to a depth of 600 fathoms makes in well to the westward, south of Jamaica. We spent eight days under the lee of N. E. Cay waiting for a lull in the trades to do the next channel; but it did not come, and we returned to Kingston, remaining there two weeks. Two lines only were run between the Pedro and Rosalind banks. The depths across were: 440, 675, 733, 642, 688, 609, 561, 478, 435 and 264 fathoms. The lowest bottom temperature was at 733 fathoms,  $40^{\circ}$ , the others all above  $40^{\circ}$ . I think it very probable that there is less water to the eastward of where we ran our lines. There was a little more than 200 fathoms in the narrow passage west of the Rosalind bank.

The bottom in the channels was very fine coral sand, not the smooth bottom found where there was a strong current. The current during February, March and April did not seem to be setting to the westward through these channels, except in the very narrow one west of the Rosalind bank. Several captains of vessels reported a northerly current to the eastward of these banks. To the eastward of Portland Rock, the eastern extreme of the Pedro bank, we found a very strong easterly current in the latter part of February, the trades blowing a gale at the time.

A line of soundings was run from Santiago de Cuba to the east end of Jamaica, and a depth of 3,000 fathoms was found 25 miles south of Cuba. Subsequent soundings proved this spot to be the eastern end of an immense deep valley extending from between Cuba and Jamaica to the westward, south of the Cayman Islands as far as the Bay of Honduras.

The Cayman Islands and the MISTERIOSA bank were found to be a submarine extension (very steep on its southern slope) of the range running along the southeastern side of Cuba. The valley is narrow at its eastern end, but widens between the western end of Jamaica and Cape Cruz, where the soundings were 3,000 fathoms within 15 miles of Cuba, and 2,800 fathoms within 25 miles of Jamaica. This valley is 700 miles long, with an average breadth of 80 miles. It covers an area of over 85,000 square miles, having a depth nowhere less than 2,000 fathoms, except at two or three points which are the summits of submarine mountains, and with the greatest depth of 3,428 fathoms. The low island of Grand Cayman, which stands scarcely 20 feet out of the sea, is really the summit of a mountain 20,568 feet above the bottom of this submarine valley, an altitude exceeding that of any mountain on the North American continent. Between MISTERIOSA bank and CHINCHORRO bank the soundings were regular at 2,500 fathoms. North of MISTERIOSA and Grand Cayman to the Isle of Pines and Cape St. Antonio, the soundings were generally 2,500 fathoms. The bottom everywhere in the western Caribbean is pteropod ooze, with a slight mixture of coral sand, which has been brought by the wind and water from the islands and keys.

A wide band of westerly current was found south of the Caymans and the MISTERIOSA bank, turning to the northward at CHINCHORRO bank, and so following the coast to the Yucatan passage. There was a narrow stream joining this main current from a passage between the ROSALIND bank and the Mosquito coast, but I did not detect any flow from the other passages. North of the Caymans we found very little, if any, current. There is said to be a current which sets strongly to the eastward south of Cape St. Antonio.

Thus I have given you a summary of the data obtained by the *Blake* in as brief a form as possible.

The development of the ridges connecting the islands and the deep valley in the western Caribbean sea are certainly very interesting, considered as physical features, and I think that the temperatures obtained at different depths, especially on the ridge at the Windward passage, together with the currents observed, give us facts enough to lay out a possible course for the equatorial current from a point southeast of Barbadoes to the Yucatan passage. There is, certainly, a very large volume of water pouring through the Windward passage, flowing south of Cuba and so on to the Gulf of Mexico; and the temperatures of the water at different depths agree at the same season with those found in the Gulf of Mexico and the course of the Gulf Stream as I have laid it out.

Where does it get this temperature? It is not warmed in the Gulf of Mexico, for the latest theory is that it does not flow around this basin. Professor Hilgard, of the Coast Survey, has given a lecture quite recently before the Academy of Science, entitled "The Basin of the Gulf Stream," in which he shows that the current merely enters the passage at Yucatan to be forced by the head of water to the northward and westward out through the Florida straits. The currents in the Gulf are not connected with the Gulf Stream, and are very slow.

The temperature is several degrees higher at the same depth at the Windward passage than at the Barbadoes and from Trinidad to Guadalupe. The comparison of these temperatures is made from observations taken at both places in the months of January and February.

The temperature below 800 fathoms in the western Caribbean and Gulf of Mexico could only enter over the rim at the Windward passage and between Haiti and Jamaica; but at the latter point there is no current setting that way; in fact, the pteropod shells showed an eddy.

I suggest that the water of the Gulf Stream is warmed in the main Caribbean, and that there is a possible current flowing around the entire boundary. The equatorial current striking against South America is deflected north, and when it reaches the island of Tobago all that can flow between this island and the main land and south of Grenada does so. This current is said to be felt along the Spanish

Main. The greater part of the equatorial current, however, is deflected north between Barbadoes and the Grenadines, finding its way to the westward whenever it meets a passage. Passing through, it would naturally be driven towards the Spanish Main by the trade winds, and thus bank up in the southwestern corner. While working between the islands south of Guadalupe we were always well to windward during the night, and therefore felt the northerly set which I wrote of to Mr. Patterson, but north of Guadalupe, in April, we had comparatively calm weather, and here the current came from the westward, and above Saba island was flowing as if to follow around the Virgin islands. After turning these, it would be helped along towards the Windward passage by the northeast trades.

As stated, the temperature to 400 fathoms suddenly increased, as we passed north of Guadalupe. Could not this be accounted for by the equatorial current having made the circuit of the main Caribbean and been warmed on its passage over shoals and banks, after traveling nearly 3,000 miles? The current said to flow along the Spanish Main would be deflected north by the Isthmus and keep on following inside, or to the eastward of the banks connecting Jamaica with the main land, and so south of St. Domingo, to pass out through the Mona passage and the Anegada passage, to flow along north of Porto Rico and St. Domingo to the Windward passage. We found a current in the latter part of April flowing north through the Mona passage and joining the current to the westward.

Of course we must have many more facts to substantiate any such theory as I have given. The temperature of the water at different depths must be observed to the eastward of the Anegada passage and over the main Caribbean; and these temperatures must be taken in the same season at the different localities.

I will not occupy your attention any longer here, but you can deduce your own theories from the facts given. The contour lines drawn on the map, with the exception of those along the coast of South America, are from the soundings of the *Blake*. The 100 fathoms curve, is from the United States and English surveys.

Last summer during several weeks the *Blake* was employed entirely on a dredging cruise, extending from a point off Charleston,

S. C., to the Georges banks. Professor Agassiz accompanied the vessel, and named localities for dredging and cared for the life obtained. We had dredged off Charleston in 100 fathoms, then in 200 fathoms. Mr. Agassiz wanted 400 fathoms for the next haul. We steamed to the eastward, but instead of finding deeper water it shoaled. The soundings across the stream were as follows: 142, 198, 225, 217, 236, 229, 258, 334, 382, 364, 337 fathoms.

The next point for dredging was off Cape Hatteras. To reach this point, I kept in the imaginary axis of the stream as marked on the chart, and sounded every five miles, with the following depths: 257, 291, 274, 288, 265, 262, 257, 247, 233, 246, 267, 288, 310, 338, 362, 400, 457, 892, 1,386, the above from lat.  $32^{\circ} 00'$  N. to lat.  $33^{\circ} 30'$  N.

These soundings were announced in the newspapers as the discovery of a plateau extending from the Carolinas to the Bahamas. This plateau was known at the Coast Survey office. Professor Bache spoke of it as long ago as 1856. He stated: "The discovery has been made that soundings can be carried nearly across the Charleston section of the Gulf Stream, and that after losing them on this section for a short distance, they were reached beyond the axis of the stream, as resulting from the observations of Lieutenants Maffit and Caven, U.S.N., Assistants in the Coast Survey." He says: "The bottom of the sea slopes gradually in this section for some 50 miles, reaching a depth of about 20 fathoms; then more rapidly to above 65 miles and the depth of 100 fathoms, and suddenly falling off to a depth *greater* than 600 fathoms; at about 100 miles from the shore, where the depth is 300 fathoms, a ridge with a very steep slope on the inshore side, and a little less to seaward, occurring 1,500 feet above the hollow to seaward of it, and distant about 12 miles from it. A second rise of 500 feet, on a base of 12 miles, followed by a depression of 300 feet on a base of 15 miles, and then by a gentle slope upwards. It is altogether probable that all the depths found by observation are greater than the actual ones, but the bottom was brought up in several cases, showing that the lead had reached it. It is most probable that the proportions are not far from correct."

It will be seen how difficult it was to obtain the depth with the

old methods. The soundings over this section were reduced one-half by the *Blake*, and at this rate the temperatures taken can hardly be relied upon. We were a little more than two minutes taking these soundings, and always brought up a specimen of the bottom. The temperatures that I find in the diagram of Prof. Bache are not as low as those of the *Blake*, although we had less water. The season was the same—in July. The temperature of  $57^{\circ}$  was found at 350 fathoms, and also at 600 fathoms, by Craven and Maffit. The thermometer probably never reached the bottom. We found a temperature of  $45^{\circ}$  to  $46^{\circ}$  from 300 to 380 fathoms. The bottom off Charleston was coarse grey sand, black specks, broken shells to 100 fathoms; then fine green sand and black specks, then came coral sand and broken shells and pteropod shells. As we came more into the stream, the bottom was washed bare, but the cylinder brought up small pieces of coral rock and coral sand. Mr. Agassiz has reported on the life obtained.

As we came north along the Gulf Stream and the water deepened, glob. ooze began to appear in the bottom specimens. The investigation of the Gulf Stream off Florida and as far as Hatteras, will be renewed by the *Blake* in the spring. The temperature of the water off the Georges bank in 300 fathoms was  $40^{\circ}$ . Other soundings and temperatures that we took last summer are interesting, but I must close my remarks, as I wish to speak of the methods of obtaining the results given you this evening. Some of my hearers have probably seen Lt.-Comdr. Sigsbee's very interesting and instructive book issued by the Coast Survey on deep sea soundings. I wish all interested in this subject could read it. Lt.-Comdr. Sigsbee was in command of the *Blake* for four years, and sounded the whole of the Gulf of Mexico, making the necessary examination into its physical conditions. Most of our apparatus was either invented by this officer, or are improvements on known methods.

The *Blake* is a small steamer of 320 tons, belonging to the Coast Survey. She is manned by eight officers and 38 men, and is fitted expressly for deep sea sounding and dredging. It has been my good fortune to have associated with me on this duty, officers who have rivalled me in their interest in the work. The great work

done by the *Blake* bears testimony to their earnestness, and the records to their care and precision.

[The reading of the paper was followed by a description of the methods employed on board the *Blake* in obtaining depths, temperatures, etc. Models and drawings were shown of the different instruments.

A vote of thanks was tendered to Commander Bartlett for the reading of his paper before the Society, and a copy requested for publication.]

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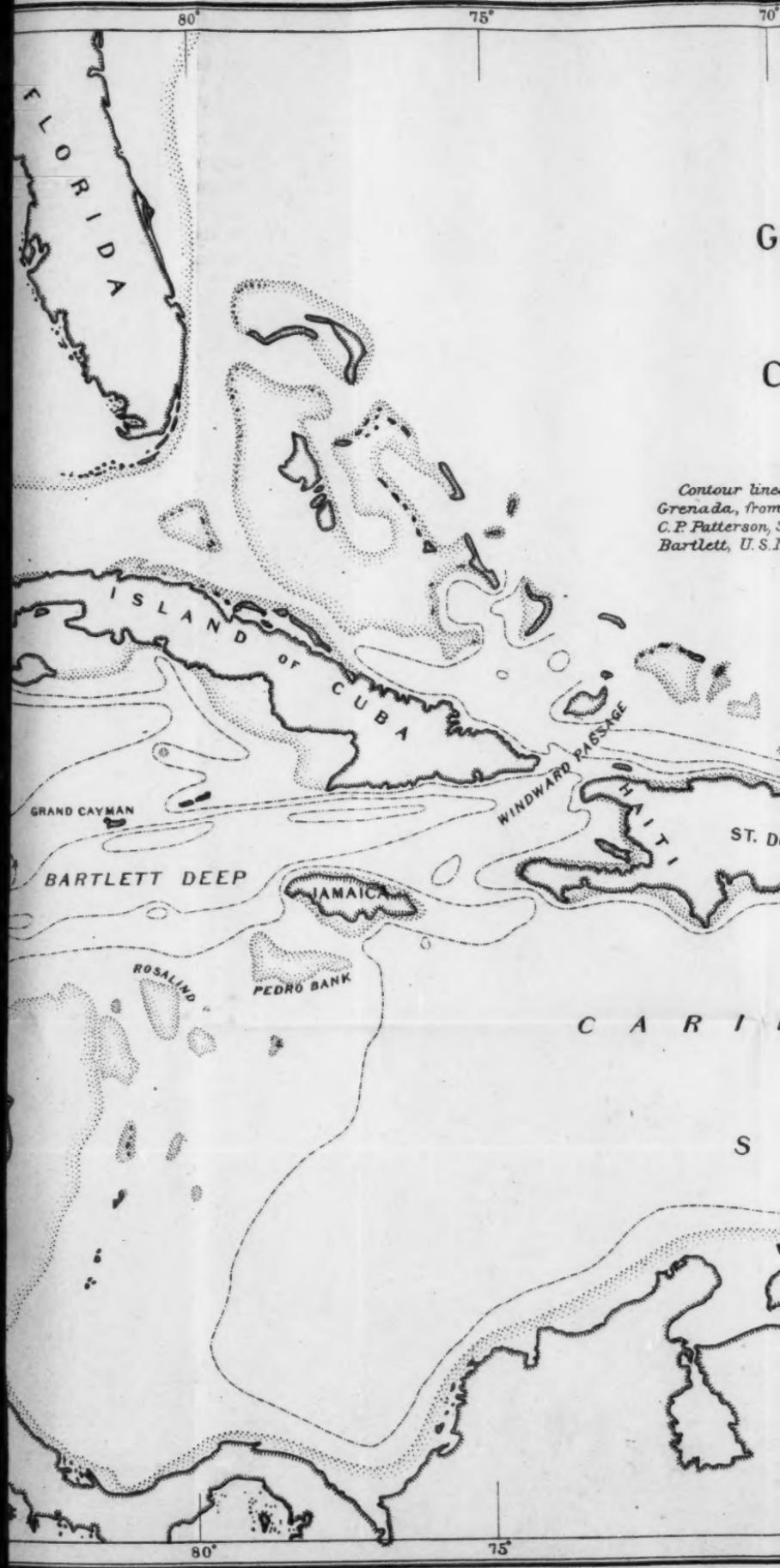
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CHART OF THE  
GULF OF MEXICO  
AND  
CARIBBEAN SEA

Contour lines, except in the main Caribbean Sea from Pedro Bank to  
Cuba, from soundings taken in steamer 'Blake' under the direction of  
Patterson, Superintendent, by Lt. Comdr. C. D. Sigsbee and Comdr. J. R.  
Orllett, U. S. N., Assistants Coast and Geodetic Survey.

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## A CRUISE ALONG THE NORTHERN COAST OF AFRICA.

BY LIEUT.-COMMANDER HENRY H. GORRINGE, U. S. NAVY.

Observe how small is the distance that separates the north coast of Africa, between Tunis and Alexandria, from the opposite coast of Europe and its outlying islands. It is only seventy-five miles from the west end of Sicily to Cape Bon, and less than 200 from the beautiful city of Palermo to the squalid capital of Tunis. One night's run of an Atlantic steamer would enable you to go from the Opera House in Malta, filled with the fashionable society of a British garrison, to the magnificent ruins of the amphitheatre of the ancient Leptis Magna—deserted, save by the owls and jackals. The contrast between the two regions and their inhabitants is very striking and remarkable in view of their close proximity. The waters of the Mediterranean, that separate them, form an impassable barrier between the destructive influences of the great Saharan desert and the civilization of Southern Europe. The Sahara has caused the gradual desiccation and depopulation of the narrow, fertile strip that once separated it from the Mediterranean, which has been gradually growing more narrow, until to-day it forms a part of the desert. The scanty population remaining is now gathered in a few oases, widely separated by arid plains, over which lie scattered numerous remains of ancient cities, rapidly disappearing under the accumulations of sand.

My opportunities for inland exploration were very limited, chiefly owing to the short time allotted to the cruise. After visiting the site of ancient Carthage, of which nothing remains above ground but its magnificent aqueduct and cisterns, we cruised along the eastern coast of the ancient Zeugitana and Byzacium, now the regency of Tunis, and anchored in the Gulf of Gabes, the ancient Syrtis Minor. From this point I made an excursion to the proposed French "Inland Sea."

Several explorers, who had made rapid journeys through the southern part of Tunis in the beginning of this century and within ten years, had reported that a considerable part of the great valley that lies between the two easternmost spurs of the Atlas chain, and

known as the region of the *chotts*, was below the sea level. Without instruments of precision to test the levels, everything in its appearance justified them in that belief. Standing on any eminence and looking over the vast basin, you would feel confident, not only that it is below sea-level, but that it is actually flooded. The contrast between the surface of what looks like water and the adjacent plain is very great. The one is slate-colored, smooth, without visible undulations, and devoid of any form of vegetation ; a mist hangs over it, especially in morning and evening, that aids in the deception to an extent that cannot be described. The other is gently undulating, intersected by the beds of winding streams and rivers now dry, and almost covered in the Winter with tufts of grass and weeds. A few oases and occasional masses of isolated rock break the monotony of the view ; but the stillness and desolation is very oppressive, yet very fascinating.

Everything indicates that at no very distant day a chain of lakes extended through this valley from the Gulf of Gabes, a distance of 250 miles to the westward. Some explorer will probably find the bed of a river that received the eastern drainage of the Atlas Mountains and supplied the evaporation from what was once the flooded area. This is estimated at about 5,000 square miles.

Within five years several explorers have been sent by the French and Italian governments to ascertain approximately how much of this region is actually below sea-level, with a view to admitting the waters of the Mediterranean by means of a canal from the shores of the Gulf of Gabes, in order to ameliorate the climate and restore the fertility of the valley. These explorers have found that the total area actually depressed below the sea-level is about 3,000 square miles, the mean depth about eighty feet, and the least distance from the nearest depression to the Mediterranean is 102 miles.

The French explorers maintain that instead of a chain of fresh water lakes, the depressions were an estuary of the Mediterranean, and explain the desiccation of the region by the theory of an upheaval of the coast, which cut off the water supply. But an eminent French engineer, Prof. Fuchs, has shown that the geological formation of the narrow strip that separates the nearest bed of the former lakes from the sea, which is only twelve miles in width,

is such as to render that theory highly improbable. If there has been an upheaval of this part of the coast, it is an exception to the well-established fact that the north coast of Africa has been sinking in historic times instead of rising.

Opinions differ as to the feasibility of cutting a canal to flood the depressions, and as to the results of flooding them. It is conceded that the evaporation from the flooded area would be sufficient to ameliorate the climate of Southern Tunis and reclaim for cultivation a vast region now arid and uninhabited. The soil needs only water to render it unequalled in fertility. Wherever springs or wells afford a supply for irrigation an oasis is found yielding grain and fruit in abundance. The extremes of temperature, now very great, would be diminished. We observed in our camp on the desert in February, 1878, a range from 29° Fahrenheit at three in the morning to 86° at noon. Unable to lie still long enough to go to sleep after midnight for the cold, we were almost overcome by the heat of mid-day. One of the great advantages to be derived from flooding the valley would be the creation of a water way to the southern provinces of Algeria, and this accounts for the great interest shown by the French in the subject. M. de Lesseps visited the region, and a canal would probably have been commenced had his attention not been directed to Panama. Notwithstanding the fact that the route of the proposed canal passes through many miles of quicksands, in which caravans that have lost their way in crossing the *chotts* have been swallowed up, the French engineers regard it as entirely feasible. Doubtless they will find it as easy to control the quicksands of Africa as the floods of the Chagris in Central America. The estimated cost of the canal is about five hundred millions of dollars. Such an outlay would not be justifiable for flooding an area of 3,000 square miles—about one-tenth of that of Lake Superior. The world is not yet so thickly peopled as to make it necessary to provide more room. We can offer to European emigrants for some years to come arable lands at lower rates than the promoters of the French Inland Sea scheme could afford to sell land reclaimed at such a cost.

Not the least interesting recollections of my trip to the proposed Inland Sea are those of the numerous Greek and Roman ruins that were scattered along the route. Vestiges of ancient towns were

seen where now there is not a living creature. A part of our route lay along an old Roman road marked by the ruins of small forts and block-houses at short intervals. At one oasis where we rested at mid-day our guides took us to an old Roman bath, faced with marble and in excellent preservation, through which a hot spring flowed abundantly. Where the water came out of the ground at some distance from the bath, it was hot enough to scald the flesh. The spring is highly prized by the Arab inhabitants for its curative properties, and I secured a bottle of the water, intending to bring it home for analysis.

The most interesting ruin of this whole region is that of the celebrated African Coliseum of Tisdrá, a day's journey from the port of Sphax, at the head of the Gabes Gulf. It is in the form of an ellipse, the greatest diameter at the base being 430 feet, and the least 370, the corresponding diameters of the arena being 240 and 180 feet. Although third in size, being smaller than that of Verona, it ranks next after that of Rome in the state of preservation and architectural effects. The structure consists of four tiers of arches and columns, having a total height of nearly 100 feet. The capitals of the columns bear a striking resemblance to those of Diocletian's Column at Alexandria, generally known as Pompey's Pillar. The gateways at each end and the upper tier of arches were nearly destroyed about one hundred and fifty years ago by the reigning Bey of Tunis to prevent the Coliseum being used as a fortress by some of the Arab tribes in revolt against his authority. The keystones of the lower tier of arches were originally decorated with sculpture, of which only a few fragments remain. Surrounding this almost indestructible monument of the power and wealth of the inhabitants of the region about twenty centuries ago, are the huts of its present inhabitants, presenting one of the most striking contrasts to be found in all Africa. I know of no better way to describe an Arab village than to compare it to a cluster of old-fashioned masonry ovens; the dwellings are without windows, and the aperture through which they are entered is only large enough to crawl into; the interiors are black and smoky, and in the dim light one sees dogs and sheep, children and donkeys, and women and men crowded together in them.

At the southern termination of the Gulf of Gabes is the Island of

Djerbah, presenting a marked contrast to the neighboring coast, which is perfectly barren, without any inhabitants, while the island is covered with trees, has an abundant supply of water, and is very thickly populated. During the Saracenic wars of the middle ages it was the scene of one of those terrible conflicts between the Moors and Spaniards that resulted in the annihilation of the latter. On the northern coast there still remain traces of a pyramid that had been built out of the skulls of the Christians as a warning to them not again to attempt the conquest of the island. One of the most interesting features of this island is its manufactures of woolen and silk fabrics, hand-made, of very fine texture and exquisite coloring.

Eastward of Djerbah not a habitation is seen until you reach Tripoli, although the remains of ancient Roman and Greek settlements are very conspicuous from the sea. Of the three cities, Sabrata, Oea and Leptis, that formed the ancient Tripolis, from which the present town derives its name, the ruins of Leptis are the most interesting. We visited them twice.

Lying scattered on the beach where we landed were numerous Cipollino marble columns, three of which were thirty feet long and four feet in diameter. They appeared to have been moved to this point for shipment. The marble is variegated in color, the green predominating, and the polished surfaces are very beautiful. There were many varieties of the granite and marble and a great number of the columns and fragments of capitals lying scattered along the route from the sea to the ancient city. Among the most striking were large masses of syenite, that must have been brought from Egypt. The diameter of one of the fragments of a column of syenite is  $4\frac{1}{2}$  feet. In one spot on the west side of the old port there were thirteen columns of gray granite, evidently gathered there for removal. At another point there was a row of 11 columns of variegated green marble; only the tops were seen sticking up above the sands. This row is within the massive walls of a large edifice, which have toppled over without breaking. In many places the quays of the old port are still visible. They are lined with marble and show extraordinary care in their construction and adornment. The port is now filled up with sand, and the river that once flowed through it is now dry in Summer. No systematic excavations

tions have ever been made at Leptis, but the French and English have removed from the surface many of its most beautiful columns and interesting relics. The Church of St. Germain Des-Prés, in Paris, is adorned with some of the columns taken from Leptis; and Admiral Smyth removed many more, that are now in the Royal Gardens at Windsor. Overlooking the sea at the entrance to the ancient port are the remains of a fortress remarkable for its massive walls, constructed of blocks of granite, many of which exceed ten tons in weight. This fortress appears to have been connected with the city by a subterranean passage of very early date. No cement or mortar is used in the construction, the stones being hewn so as to fit exactly in their places at the crown of the arch. The sea now washes into the mouth of this passage and renders it very difficult to explore.

In the Augustine era Leptis was probably the most populous and prosperous city in Africa. It is described as encompassed by strong walls of masonry, pierced with magnificent gates, and ornamented by spacious porticos, portions of which still remain to prove their former splendor. The ruins of aqueducts, and reservoirs in excellent preservation, indicate that it had a large population. Its only commercial importance at this time is in the supply of millstones that it furnishes for exportation to Sphax and Sousa on the Tunisian coast. These millstones are obtained by breaking the marble and granite columns into suitable lengths. The neighboring region is, however, rapidly growing in importance, owing to the alfa or esparto grass, which grows in great abundance, and is gathered by the natives for exportation to Europe, where it is made into paper pulp. In this form it is shipped to America.

Between Leptis and Berenice is the great Syrtis, the shores of which are but little above the sea level, and are devoid of any object of especial interest. Less than a day's journey inland from the southernmost part of the gulf there is a sheet of water known as the Sulphur Lake, the bottom of which is said to contain an inexhaustible supply of pure sulphur. The gulf is resorted to during the Summer by thousands of Greek sponge fishers, who now use the regular diving apparatus, and work in depths of 180 to 200 feet. Before the adoption of the diving apparatus the average loss of life from the sharks—particularly ferocious in this vicinity—was three

a year. A fisherman told me that a shark will not come near a diver in armor. Occasionally they bite the air tube in two, with fatal results to the diver. The eastern coast of the gulf is a very narrow strip of sand separating its waters from those of extensive lagoons which yield an abundant supply of salt in the Summer season. The waves of Winter wash over the low sand and fill the lagoons, while the intense heat of the Summer evaporates the water and leaves them a solid mass of salt. Small quantities are annually gathered and piled into mounds. I measured one mound and found it 80 feet in height. These are probably the salt hills reported by the early travelers through this region. The surfaces are preserved by burning straw over them on the approach of Winter, rendering them impervious to water. By digging through these mounds you may trace the annual deposits of many centuries.

The five cities of the ancient Pentapolis were Berenice, Arsinoe, Ptolemais, Apollonia and Cyrene. Their sites are marked to-day by the remains of temples and massive walls and numerous tombs hewn out of the rocks. Berenice, at the east boundary of the Great Syrtis, has been more nearly destroyed than any of the others, for the purpose of constructing the modern town of Benghazi, and an Arab fortress that stands near its site. Blocks of marble, with Greek and Latin inscriptions, fragments of capitals and statuary, and sculptured cornices are frequently seen, upside down, built into the walls. No excavations have been made at the site of Berenice, chiefly owing to its being at this time a Moslem cemetery. Next to their harems the Mohammedans guard their cemeteries most jealously from Christian hands, and they will never consent to excavations on this site.

In the neighborhood of Benghazi the surface of the ground is frequently broken by precipitous chasms, fifty or sixty feet in depth. At the bottom of the chasm there is invariably a surface of rich soil, and also an abundant supply of moisture. The change from the arid and barren surface of the surrounding desert to these spots of luxuriant vegetation is very striking. The gardens of the Hesperides are believed to have been in the vicinity of Berenice, and many are of the opinion that these fertile spots at the bottoms of the chasms are what remains of them. In one of the chasms, about seven miles from Benghazi, is the entrance to a cave which

leads to an extensive sheet of water, believed to be identical with the river Lethe. I transported a boat across the desert on the backs of two donkeys, side by side, and launched it on the waters of this famed river, which we found clear and cool and fresh, as if constantly supplied by springs. It appears to run through a series of chambers, with very narrow passages connecting them. We observed a sensible current. The walls of the chambers are in part, at least, artificial, and on them are engraved many inscriptions. No extended exploration of this curious subterranean stream has ever been made; no one knows where it comes from or where it goes to. It would be very interesting to find out, and instructive to copy the inscriptions, some of which are believed to be in Punic characters. I can very well understand the extravagant terms in which the ancients described the Lethe. In the Spring there prevails along this coast a hot-air blast—it cannot be called a wind—that comes from the great desert further south. The air is laden with insects and fine particles of sand, and is hotter and drier than any one who has not experienced it can conceive of. I have observed a temperature of 131° F. in the shade during one of these blasts, called by the natives *giblehs*; on one occasion I was indiscreet enough to wet my head with salt water, in my efforts to allay the intense suffering caused by necessary exertion. In a few moments my head was covered with a crust of salt, so rapid had been the evaporation. These winds rarely last through the night, and usually return each day for three or five hours. My theory in regard to the Lethe is that it was an artificial subterranean retreat from the discomforts of these hot winds for the inhabitants of the ancient city, who were certainly wealthy enough to create it, if we may judge from their works on the surface. The air in the cavern maintains a uniform temperature of about 65°, and that of the water about 55° F.

The famous fountain of Apollo, which issues from a rock at Cyrene, is similar to the Lethe, but not as large. Beechey, who explored it, states that the channel is formed entirely in the rock, from which the stream issues and runs in an irregular course for nearly a quarter of a mile into the mountain. The sides and roof of the passage are flat, where time and the action of the current—which is very strong—have not worn them away. The general height of the channel is about five feet, and its average width is

from three to four feet. Beechey says, that he observed, while exploring this passage, that the clay that had been washed down in considerable quantities by the current was occasionally plastered against the sides of the channel, and smoothed over very carefully. On this he found Greek inscriptions, some of which, from their dates, must have remained in the wet clay for more than 1,500 years. The earliest and most conspicuous dates that he copied were those of the reign of Diocletian.

The extensive ruins that mark the site of Ptolemais are very conspicuous from the sea; among the most striking are three large Ionic columns close together and still standing amidst the débris of what was once a large temple. Beechey says that the walls of the ancient city enclose about a square mile of ground; and within them are massive ruins abounding in fragments of statuary and sculptured slabs, many with inscriptions. Outside of the city walls are the remains of many structures—prominent among them a spacious mausoleum built by Ptolemy Euergetes Second, to whom the Romans had assigned the Cyrenaica as a kingdom after having deposed him in Egypt. Among the inscriptions copied at Ptolemais there is one in Greek on a slab built into the base of the three columns referred to, bearing the names of Cleopatra and Ptolemy Philometer, and also Arsinoe and Berenice, Egyptian sovereigns of the Ptolemaic dynasty.

The plain on which all the cities of the Pentapolis, except Cyrene, stood, is a narrow strip between the sea and a range of hills that borders the coast from Benghazi eastward to Dernah. This range rises first to an elevation of about 1,000 feet, where the surface forms a table land extending several miles inland, and then rises again to form a ridge. Cyrene stands on the table-land very picturesquely situated and difficult of approach through the narrow gorges of the mountains, the steep slopes of which form a natural defense. The hillsides are everywhere honey-combed with tombs, some of them now occupied as Arab dwellings, and many of them are unexplored. From Apolonia, the seaport, the ascent to Cyrene is through a beautiful valley, where the vegetation is still more general than anywhere else on this coast, and, aside from its associations with the past, the natural beauties of the scenery are enough to attract the tourist, if only he could get to them. But you cannot reach Cyrene without undergoing the hardships and dangers of a tedious land

journey either from Alexandria or Benghazi. The region is without commerce and almost depopulated. The wandering tribes of Arabs that pasture their herds of sheep and cattle are more vicious and fanatical than any others along this coast, and would be dangerous if they were well armed. Hundreds of steamers pass almost in sight of it weekly on the voyage from the Straits of Gibraltar to the Suez Canal, and not one ever touches at any part of this coast, because there is no commerce to attract them. The Winter climate is unsurpassed for salubrity ; the temperature is equable and the air dry and exhilarating. Cyrene was, in its flourishing days, a health resort, much as the south coast of France is to-day ; in addition to the climate, admirably adapted to the cure of pulmonary diseases, there was a plant, the *Sylphium Cyrinaicum*, the extract from which was believed to be almost unfailing in the cure of these diseases. It was not cultivated, but grew wild on the hill-slopes. By an incision in the plant or its root the juice was obtained, which Pliny recommended for every form of disease. So great was its value that the word *Sylphium* became synonymous with that of riches. Among the sacred gifts at Delhi was a plant of the *Sylphium* sent by the Lybians. In the Roman public treasury the *Sylphium* was preserved with the gold and silver ; and Pliny mentions as a remarkable occurrence that in the year of Rome 661, about a century before Christ, thirty pounds of *Sylphium* were imported to Rome. Under Nero the plant became so scarce that one specimen was sent to him as a great tribute. The *Sylphium* no longer exists. It is supposed to have been destroyed by the natives to avoid the payment of an oppressive tax to which the country was subjected on its account by the Romans. The *Thapsia Garganica* that now abounds in the Cyrinaica is undoubtedly of the same species, for it resembles the *Sylphium* engraved on the ancient coins of Cyrene.

The only systematic excavations that have ever been made in the Pentapolis were carried on by two British officers in 1860 at Cyrene.

Nothing that I could say would convey to your minds more clearly than the views that will now be thrown on the screen the results of their work. And when it is remembered that there are four more cities of the Pentapolis, and as many more further east, any one of which would probably yield from its ruins an equal return, it is surprising that some efforts are not made to explore them and recover the art treasures that lie buried in the sands.

LIST OF ILLUSTRATIONS.

DURING THE LECTURE.

No. 1. The African Coliseum at Thysdrus.  
" 2. Entrance to the River Lethe.  
" 3. Fountain of Apollo, Cyrene.  
" 4. Ruins of Ptolemais.  
" 5. Ionic Columns, Ptolemais.  
" 6. Christian Church, Ptolemais.  
" 7. Mausoleum of Ptolemy Eugertes Second.

AT THE END OF THE LECTURE.

" 8. Ruins of Imghernis, on the route to Cyrene from the  
\* coast.  
" 9. Tomb in Northern Necropolis, Cyrene.  
" 10. Tomb for 105 Sarcophagi.  
" 11. Tomb in Northern Necropolis.  
" 12. " " Western " "  
" 13. General View, Northern Necropolis.  
" 14. Tombs, Northern Necropolis.

*Some of the Statuary found at Cyrene by Captains Porcher  
and Smith in 1860.*

" 15. Hadrian.  
" 16. Iconic Head in Bronze.  
" 17. A Ptolemaic Queen.  
" 18. Antoninus Pius.  
" 19. Unknown, probably a Roman Emperor or Praefect.  
" 20. Aphrodite Euploia.  
" 21. Aprodite and Eros.  
" 22. Iconic Figure.  
" 23. Perseus.  
" 24. Lybia crowning the Nymph Cyrene while overcoming  
the Lion.  
" 25. View of Dernah.  
" 26. Aqueduct, Carthage.  
" 27. Cistern, Carthage.  
" 28. Mosaic, Carthage.

## NOTE ABOUT THE TOMBS OF CYRENE.

The most striking evidences of the former grandeur of Cyrene are the Necropoli, which consist generally of tombs hewn out of the solid rock. Many of them are still in excellent preservation. They extend for miles in every direction outside of the city walls the most remarkable are those on the western side of the city, through the ravine that leads to the port of Apolonia. The tombs cut into the faces of the hills are arranged in terraces, the rock being cut into steps to allow of free access to them. Some of the exteriors are beautifully decorated with marble columns and ornamented with bas-reliefs, now mutilated. The fanaticism of the Mohammedan Arabs impels them to destroy everything that represents animal life in inanimate matter; this accounts for the destruction of the statuary, and the fact that it is found in fragments generally lying close together. After having broken it, they did not care to remove the fragments—indeed, they are so numerous that they could not obliterate them. A piece of statuary that is the work of a master is almost indestructible; each fragment bears its own testimony to the merits of the whole, and has its value as a means of study and elevation. When we reflect that the marble representations of the human form wrought during the period when Grecian art was at its best are the standards of to-day, and that the best work of modern times is little better than awkward and lifeless variations of these standards; and when we remember that there lie buried in the ruins of the Tripolis and Pentapolis fragments of the originals, and antique copies of many of the best works of the Greek masters—for Cyrene was a famous school of Greek art—it is inexplicable that some earnest effort is not made to recover the fragments before it is too late. There are no serious difficulties in the way. The Arabs, although hostile to Christians, are so poor and in need that they would soon learn the advantages to be derived from the spending of considerable sums in their employment. Labor for excavating would not cost over twenty cents per average day's work, and other things, such as transport and food, are correspondingly low. In my dealings with these Arabs I found no difficulty in converting their hostility to friendship.

## CHILE—ITS GEOGRAPHY, PEOPLE AND INSTITUTIONS.

BY JAMES DOUGLAS, JR., ESQ.

When I had the pleasure of addressing you more than two years ago the embers of war between Bolivia and Chile were smouldering. In February, 1879, they broke into a flame; and soon the utter powerlessness of the allied forces of Bolivia and Peru to confine the war to its original seat and prevent the victorious Chileans occupying the whole sea coast became apparent. On sea both foes performed deeds of daring and skillful seamanship, such as one had begun to think were the lost attributes of the naval warfare of a past age, and which were worthy of the teaching and example of the father of both navies—that eccentric hero, Lord Dundonald, who spent many years of his life in aiding Chile and Peru to attain their independence. But on land no single victory of any consequence crowned the allied arms or checked the irresistible advance of the invader, who still occupies his enemy's capital, waiting till a goverment is organized with which to make peace. It is by a strange fatality that the two most beautiful capitals of the two hemispheres, Paris and Lima, should within eleven years have been bombarded by a foreign enemy and then sacked by their own lawless population.

With the details of the war we have not to do, but the question comes up for answer, wherein lay the vast superiority of the Chilean over his foe?

It is certainly not due to the greater military force of the southern power, for at sea, when the war broke out, Chile with 54 guns opposed Peru with 56, and on land Chile's regular army consisted in 1875 of :

Infantry.....	2,000
Cavalry.....	804
Artillery.....	3,516

while at the same date Bolivia mustered 3,000 men and Peru 13,000 men.

But Chile had a reserve force in a national guard of 24,287 men, and a still more efficient reserve force in a population accustomed to see the law respected by their rulers and to submit to it themselves. In the main, Chile won her victory by force of character rather than by force of arms; and this character owes its formation, like national character always, to many concurrent influences.

Chile was the poorest dependency of Old Spain, as well as the most remote and inhospitable. Instead of replenishing the national treasury, she drew on it for about three-quarters of a million annually. Her exports in 1790 were a little wheat and about \$1,300,000 worth of gold, silver and copper. Poverty saved her, therefore, from that horde of hungry officials who flocked to the colonies from Old Spain, not for love of the colonists, but to glut themselves with the spoils. All official posts, even to inferior judgeships, were filled by nominees from the rapacious mother-country. At Lima the Viceroy held his court, the headquarters of officialism and corruption. Peru yielded great wealth of the precious metals, on which the Crown levied her dues, and of which dues the officials stole their full share. Peru, moreover, kept up a brisk trade for those days with old Spain in many vegetable and animal productions peculiar to the tropics. But while to look after trade, officials are needed, to raise the staples of trade, bone and sinew are required; and these neither the Spanish official nor land-owner would exercise in such ignominious pursuits. The Indian population, weak and exhausted by hard usage, being insufficient to supply the needs of agriculture, the negro was introduced, and with him another element of future social and political anarchy. From this evil, also, the poverty of Chile's soil saved her. At the same time her severer climate had bred a more sturdy, indigenous race, and demanded more industrious habits from their Spanish conquerors.

The story of the easy overthrow of the great sensuous empire of the Incas by Pizarro and his little band of adventurers is one of the romances of history. Northern Chile was the most remote of the provinces which yielded an uncertain fealty to the Incas and which they had wisely connected with the centre of empire by including it

within their wonderful system of roads. Thither Almegro, Pizzaro's lieutenant, marched with a handful of men. In the Copiopo valley, the first fertile strip in northern Chile, he was received without resistance and given gold ; but as he traversed range after range, in his progress southward, he was met with hard knocks, not treasure, and for six years with difficulty held his own against coalitions of the Indian tribes. He fortified the hill of Santa Lucia, at the head of the great valley, and there, with the keen appreciation of the present and future fitness of sites which we generally find guides the pioneers of civilization, he and Valdivia founded the capital of the kingdom of Chile.

Valdivia succeeded him, but Valdivia carried his conquests only 300 miles further south, where he met the invincible tribe of the Araucanians, who have since successfully resisted every attempt at subjugation, whether made by Old Spain or Chile. Such was the sturdy stuff out of which the *peon* population of Chile has been moulded.

And the Spaniard who emigrated thither did not find nature willing to support him without an effort on his own part. The climate being dry and the country mountainous, there was but little fertile valley land to be offered him compared with the area of sterile mountain side, which, at best, produces verdure sufficient to feed cattle. The original grants, therefore, allotted to the settlers an expanse of territory wide enough to be tempting, but which could be of value only to those wealthy enough to possess great herds of cattle. And in those early days there sprung up a system of modified serfdom, helpful alike to landlord and tenant, which still exists and has not been without its political influence under the Republic.

The *haciendado* permitted the *enkelino* to occupy a certain space of irrigated valley land and to feed so many head of cattle on the hillside in return for so many days' work. The *enkelino* has no proprietary right, but custom has made his tenure of his holding sure, and thus for generations the same family has occupied the

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\* It is a curious coincidence that the Araucanians south and the Yaqui Indians on the west coast north of the equator, should the one have been able to maintain their independence against Old Spain and Chile, the other against Old Spain and Mexico.

same *rancho*, and by slow degrees, in some few cases, grown rich. One is reminded of the somewhat similar system by which the French Government tempted both the *seigneur* and the *payson* to emigrate to New France by ceding to the *seigneur* miles of territory from which he was obliged to rent to the *censitaire* his farm at a nominal sum, but which the *censitaire* could not transfer without payment of *lods et ventes*, or a mutation fine of one-twelfth.

Thus there grew up in Chile a powerful land-owning class on which the rural population was virtually dependent, and which, though not allowed to hold offices of state under the old *régime*, was never overshadowed by a political class, and which, after the declaration of independence and after fourteen years of struggle against the radical elements of the towns, gained political control and framed a constitution with a view to holding it.

The revolution in Chile was, through their influence, conducted very differently, and to a very different issue than elsewhere among Spain's revolted colonies.

She, like the other South American colonies, remained in profound peace till the abdication of Charles IV. of Spain in favor of Joseph Bonaparte, and his quarrel with his son Ferdinand VII. In imitation of the mother country, *juntas* were formed in Chile to support the cause of Ferdinand; but the colonial authorities, whatever their leaning might be, rigorously opposed such assumption of political activity, foreseeing clearly whither it would lead. It thus arose that during the first stage of the war—from 1810–1815—although the colonial *juntas* nominally acted for Ferdinand, and headed their documents with his name, they were treated as revolutionary bodies endeavoring to throw off the Spanish yoke.

On September 18th, 1810, was held the first provincial assembly of Santiago, which in the following year resigned its power to a congress representing more constituencies. This congress—or *junta gubernativa*—undertook to govern in the interest of the legitimate sovereign of Spain, and in opposition to the constituted authorities. It enacted at least one notable measure—it threw open the ports of Chile to the commerce of the world. For four years the country was agitated by the double warfare between royalists and patriots, and between one patriot leader and another, and

Junta followed *junta*, each acting under the veriest shadow of legitimate authority, till Ossario landed from Peru with 5,000 Spanish veterans and defeated the combined bands of patriots, whose leaders had been public-spirited enough to lay aside their feuds and resist the common enemy.

The more prominent patriots sought refuge in the Argentine Republic, across the Andes, where the revolution had already been successful; and well they did, for Spanish vengeance, in its shortsighted vindictiveness, fell with such vehemence on those who had even wished well to the patriot cause, without assisting it, as to warn all chief conspirators on peril of life to keep beyond reach. So stringent were the measures of Ossario and his successors that ere two years had elapsed what royalist sympathy there was amongst the inhabitants had been converted into patriotic zeal, and all classes were ready to welcome and aid a military expedition of rescue which the refugees had organized in the Argentine Republic, and which, under Don Jose de Martin and Don Bernardo O'Higgins, completely routed the royalist army at Chacabuco.

The declaration of Chilean independence, which had in the previous struggle been implied but not claimed as the aim of the patriots, was now made, and O'Higgins, who had been foremost in obtaining relief from beyond the Andes and in conducting the military operations of the invading force, was proclaimed Dictator. Hostilities lasted actively till 1822, and were not concluded till 1826; at first conducted as legitimate warfare, but latterly, when the remnant of the royalist army allied itself with its old unconquered and unconquerable enemy, the Araucanian Indians, as a guerilla struggle. The Dictatorship was furthermore marked by the successes of a hastily extemporized Chilean navy, and by the glorious achievements of Chilean forces under Lord Cochrane in Peru. One cannot but admire the energy and skill shown by the Dictator, and the utter abnegation of all self-interest in furthering the patriot cause shown by the rich in devoting their means, and by the poor in giving their services. And yet, at the height of his glory, O'Higgins laid down his office at the dictation of an assembly of influential Santiaginos, when it became evident that he aimed at

exercising absolute power. It is true that this self-constituted congress was backed by similar assemblies in Concepcion and Coquimbo. Yet it is significant of the real source of the influence by which the future political constitution of Chile was shaped, that O'Higgins yielded unconditionally to the demands of the wealthy landowners of the capital, not to the intimidation of a turbulent rabble. This revolution was brought about by self-constituted deliberative assemblies, not by mobs; and the strangest phase of all is, that one of these peaceable movements was headed by General Friere, who divided with O'Higgins himself the fealty of the army.

Already parties were divided into Liberal and Conservative; the extreme left wing of the former was in favor of such extreme measures as have undoubtedly tended to promote the ill-success of independent government in the States of Columbia; the extreme right of the Conservatives longed for, though it dare not express desire, for return to Spanish subjection. Till 1833, when the existing constitution was accepted by Congress, there were many changes of administration and frequent revolutionary agitations. The first provisional constitution was so unrepresentative that the Senate would have been virtually a House of Lords. In 1828 the Liberals were in power and framed a constitution with opposite tendencies, which was adopted, subject to revision; but before the revision was effected the Conservatives came into office, impressed their ideas on the constitution as finally accepted, and remained in power until the last Presidential election, using their power not only to enforce its provisions but to pass measures, if anything, exaggerating its tendencies.

With the passage of the constitution, the stable history of the Chilean Republic begins. No Dictator has since occupied the President's chair; no Presidential election has been carried by force; Congress has never been intimidated, nor the choice of the people overtly interfered with.

Almost contemporaneously with the passage of the constitution, the national guard was created to take the place of a large standing army, and to this is attributable the fact that the influential men of Chile have generally been civilians, not military men as in Peru.

The President of Chile has heretofore been elected for a term of five years, but the constitution permitted his re-election for another term—a right which every President has availed himself of. The first President, General Prieto, reigned ten years, and took as his Prime Minister, Don Diego Portales, a man to whom Chile owes more than to any of her statesmen, for the wisdom with which he carried into action the provisions of his new constitution, creating a national guard, inaugurating a system of public schools, founding higher institutions of learning, reforming the administration of justice, opening up public lines of communication, and generally doing well and wisely the work of the creator of a new nation. But he belonged to the Conservative party, had been influential in giving a Conservative tone to the constitution, displaced the army by the formation of the national guard, and fell a victim to his own intrepidity, for he was taken prisoner by the chief of a division, which he was reviewing, prior to its departure for the Peru-Bolivian war, and foully assassinated—the only Chilean statesman who has met that fate.

It was under President Prieto that the existing constitution was accepted by Congress. In laying it before the people the President said of those who framed it: "They had no other aim than your interests, and to advance them they endeavored to lay down rules for the administration of government adapted to your special circumstances. *Setting aside theories, which are as visionary as they are impracticable*, they have fixed their attention on discovering the best means of securing forever public order and tranquility against the risks of party strife, to which heretofore they have been exposed."

The strife heretofore had been maintained by the Conservative party against their Radical opponents, now fairly defeated, and it is perhaps only natural, and certainly not without precedent, that the victor should regard his success as the salvation of his country, and thus regarding it should sometimes stretch his advantages beyond the limits of fair play. The constitution and the laws passed in conformity with it, therefore, favor the interests of Conservatism and the continued possession of office by whatever party may hold it.

I.—Absolute centralization of power,

II.—A contracted suffrage,

III.—The absence of a large standing army give the Government the means of making its influence felt so powerfully in controlling elections, and deprive its enemy of two weapons which have been used so adroitly by so-called popular leaders, when in opposition, that it is not to be wondered at if the Conservative party which framed the constitution in 1832 should still administer it in 1881.

I.—The Presidential electoral machinery resembles that of this country. The President is assisted by Ministers, who need not be members of Congress, but who by virtue of their office have seats in the House, may take part in debate, must answer questions affecting the conduct of affairs in their departments, but may not vote. The President must consult a Council of State on some important subjects, and may consult it on others. All high official appointments, whether diplomatic or executive, are in the absolute gift of the President. All subordinate nominations must be submitted for confirmation to the Senate. He may veto any act of the House, and the vetoed bill cannot be brought up for re-discussion that session, but may be passed over his veto by a two-thirds majority at a subsequent one.

The powers and functions of the House of Congress and the Senate do not materially differ from those of other representative assemblies, though the tactics used are sometimes original. For instance, in 1871, when I was in Chile, the Houses met according to law on June 1st. On July the 25th the election for President, or rather for members to compose the electoral college, was to take place. It was consequently inconvenient that Government should be questioned either as to the part officials were taking in the canvass, or on any matters the answer to which might be turned to the disadvantage of the official candidate. The Government, therefore, kept so many of their adherents out of the House each sitting that there rarely was a quorum.

In the executive and legislative departments of Government we detect a compromise between the systems of Great Britain and this

country, but in the internal administration of affairs all resemblance ceases, and we recognize a strict resemblance to Spanish methods.

According to Chap. IX., Art. 115 of the Constitution, the Republic of Chile is divided into provinces, the provinces into departments, the departments into sub-delegations, and sub-delegations into districts. 1. The superior government of each province, in all branches of the administration, resides in an *intendente*, who is to exercise the government in accordance with the laws, and in obedience to the orders and instructions of the President of the Republic, of whom he is the natural and immediate agent. 2. The government of each department resides in a governor, subordinate to the *intendente* of the province. 3. The sub-delegations are ruled by *sub-delegados* subordinate to the governor of the department, and nominated by him. 4. Each district is under an inspector nominated by and receiving his instructions from the *sub-delegados*.

There is thus a series of Government officials centering in the President, and distributed to the smallest divisions of the country; sitting as presiding officers of all municipal councils; without whose sanction the simplest municipal act cannot be performed nor a municipal tax levied; whose duty it is to watch over the judges and report any irregularity in their conduct, and to inform their superiors of all that comes before the courts of any public interest; whose first care, one may well believe, though the law does not prescribe it, must be to note the political proclivities of every influential man within their ken, and to take such steps as are deemed best to frustrate his plans if adverse, or further them if the reverse.

The laws are conclusive against official interference at elections, and the Government always issues stringent orders to the same effect; but human nature would be differently constituted here than elsewhere, if the nineteen *intendentes* of provinces, the sixty and more governors of departments, the hosts of *sub-delegados* and the swarms of inspectors, all of whom are dependent on the issue of the struggle for the maintenance of their power and emoluments, stood neutral, and did not use their immense influence, directly or indirectly, to further the cause of the leader, who they, at any rate, know

will further their own, even though the Government they serve repudiates showing favor to an official candidate.

II.—The framers of the constitution looked upon universal suffrage as one of the visionary and impracticable theories to be avoided, and therefore imposed as qualification that voters should be able to read and write, and should possess a certain income or quantity of property, the amount to be fixed anew every ten years.

The result is that, in the last Presidential election, in a population of 2,002,597, there were only 49,047 voters, or 1 in 41. The property qualification excludes all below the artisan class, and thus diminishes accordingly the demand on the bribery fund of the opposing parties; for it must be admitted, that the value of the vote held by all below the rank of professional men is rated at whatever it will sell for, and a qualification ticket, especially if the contest is to be close and sharp, has a recognized money value.

III.—But Portales supplied his country with a better safeguard against violent political changes by abolishing a standing army than by passing the most exclusive electoral laws; for revolutionary leaders in Spanish America have been generally military politicians, who have not resorted to the farce of a *plebiscite*, but to the more unerring weapon, a standing army, whereby to compass their ambitious schemes. General Prieto succeeded General Bulnes, the successful hero of the Peru-Bolivian war. But his successors in the Presidential chair have all been civilians. One of the results of the present war is that General Maquedano, the conqueror of Lima, accepted the nomination for President.\* Had the successes of the late war been won by any other Government than that of the powerful landowning class, we might fear the relapse of Chile into military dictatorship, but the Conservative party has wealth and cohesiveness with which to oppose so fatal an issue, and in its opposition to militarism it would be backed by the Liberal leaders, many of whom are men of great intelligence and probity and patriotism.

\* Happily he has not been elected.

What the boundaries of Chile hereafter will be is even more uncertain than what they have been in the past. So exceedingly ambiguous is the description in the Chilean constitution of the limits of her territory, that there has been ample ground for controversy with her neighbors. The first article of the constitution reads : "The territory of Chile extends from the Desert of Atacama to Cape Horn, and from the Cordillera of the Andes to the Pacific Ocean, comprising the Archipelago of Chiloe, all the adjacent islands and the San Juan Fernandez group." The description is taken from the old colonial register, the " Audiencia e Chancilleria real de Santiago de Chile," and defined accurately enough the isolation of Spain's poorest dependency—hemmed in by a desert, a mountain chain and the sea. And it also answered well enough to distinguish Chile from the other members of Bolivia's contemplated confederation of free States, any one of which, in the first flush of brotherly love, would have deemed it ignoble to haggle about a strip of territory, even if it had been accounted of any value. But circumstances speedily changed. It was soon discovered that independence and uniformity of political institutions did not eradicate jealousy, or curb national ambition, and in course of time, from the Atacama Desert—rather a wide boundary line, then supposed to be valueless—has been uncovered one treasure after another, till it is no wonder if the ingenuity of the best of neighbors should be stimulated to find fresh excuses for aggression.

The constitution assigns to Chile the western slope of the Andes as far as Cape Horn; but though the Andes seem to be lost in the sea before the southern apex of the continent is reached, Chile can hardly be blamed for planting the penal colony of *Punta Arenas* in the Straits of Magellan. Not content with that, she contends that the whole eastern slope of the continent south of the Rio Negro, which takes its rise in the Cordillera in lat. 36 degs. and flows into the Atlantic, and therefore all Patagonia is hers. Patagonia may be of little value, but the Straits of Magellan have become a highway of commerce since steam permitted the abandonment of the circuitous Cape route for the shorter but more dangerous passage of the Straits, and Chile showed foresight in taking possession of them. The Argentine Republic holds a different view of the

question, which revives every few years, and is discussed with a bitterness which portends war.\*

The sea alone disputes with Chile possession of her rocky coast from Cape Horn northward for 1,300 miles to the 35th parallel of south latitude. There Bolivia claimed that her jurisdiction began, while Chile wished to push her boundary north to the 22d degree, though she did not insist on fixing it further north than the 23d. In the colonial days Peru and Chile were contiguous. Bolivia then had no existence. It branched off from Peru, and constituted itself a separate power only after the revolution had broken out. Previously to that, the interior of what is now Bolivia existed as Peru Alto, under a distinct colonial organization subordinate to Peru Bajo; but on the coast, according to certain colonial documents, it would seem that the 35th parallel of south latitude was regarded as dividing the kingdoms of Peru and Chile. However, a degree more or less evidently mattered little, for a map prepared by order of the Spanish King, in 1790, and the official report of the then Viceroy, defined the limits of Chile as between the 22d and 28th degree south latitude. Amidst such discrepancies, Chile was able to make out a strong case when the discovery of guano within the debateable ground gave her a motive for extending her power as far as she reasonably could to the north, and she showed her moderation in not demanding that the 22d degree instead of the 23d degree be the dividing line. War was averted by compromise; for, by the treaty of 1866, it was agreed that the 24th parallel should divide the two countries, but that the Republic of Chile and the Republic of Bolivia should divide equally the products of the deposits of guano already discovered, or which might hereafter be discovered in the territory comprised between the degrees 23 and 25 of south latitude. Yet so little value did this export then possess, that it was not till 1870 that a commission was appointed to determine and mark the points corresponding to the 25th, 24th and 23d parallels, and to run the lines inland across the

\*THE CHILE BOUNDARY.—London, July 2.—Advices received from Buenos Ayres, under date of June 8th, are as follows: "The boundary question with Chile will be arranged by treaty without recourse to arbitration. The Andes will form the dividing line, and the straits up to Point Dungeness are to belong to Chile, while the Argentine Republic will have the whole of Patagonia. Great satisfaction is felt at the settlement of the question."

desert from the coast to the Cordillera. Just then all Chile was excited by news of the recent discovery of a new silver region 40 leagues inland from the coast, and not far from, if not within, the neutral zone. Those Bolivians who have intelligence devote their minds to politics and revolution. The mass of the people are as ignorant of what passes outside their own villages as the outside world is ignorant of them. To the Bolivian mines of Caracoles there did not flock, therefore, Bolivian miners from famous Potosi, but Chileans from Chaiarcillo. Chilean science also soon erected splendid silver-reducing works at Autofogasta on the Bolivian coast, and Chilean capital ran a railroad over the desert towards the mines. Autofogasta was also, even at that date, the seat of another Chilean industry. It was then the most southerly point at which had been opened the beds of nitre that underlie the Pampas above the coast breastwork of the Pacific from Arica, for 450 miles southward even to Taltal, in Chile. Languishing attempts to exploit this valuable salt from Autofogasta had been made by Valparaiso merchants. On the very confines, therefore, of Chilean territory, there sprung up two industries worked by Chilean labor, developed by Chilean skill and sustained entirely by Chilean capital. Since 1870, the exportation from Autofogasta has grown from an insignificant quantity to one and a half million of quintals annually, and the Chilean population engaged in mining saltpetre and silver on Bolivian soil has come to reach 15,000.

The present conflict seems to have arisen out of the determination of Bolivia to tax the produce of the Autofogasta Nitre Works and the Caracoles Silver Mine, contrary to treaty stipulations with Chile. One result will certainly be the extension of her boundary northward far beyond the limits of her former claims. The outline of the republic heretofore, as laid down in Chilean maps, but not admitted by her neighbors, was, therefore, composed of the Pacific coast, from lat. 24° S. to the Straits of Magellan, with all adjacent islands, including Terra del Fuego; the Atlantic coast running northward to the mouth of the Rio Negro, the course of that river to its source in the Cordillera in lat. 36°, the summits of the Cordillera, thence northward to lat. 24° and that parallel westward from the Cordillera to the Pacific.

Within this range, from north to south of over  $53^{\circ}$ , there is of necessity every grade of climate, from tropical heat in the Atacama Desert to perpetual winter on the island of Diego Ramirez, south of Cape Horn. And thus Chile possesses through her great north and south extension, what Bolivia and Peru enjoy through stretching across the Andes, viz.: at all seasons of the year, in some part or other of her territory, tropical heat and Arctic cold.

Nevertheless, at any given spot, the temperature is wonderfully equal. The thermometric extremes are slight between midwinter and midsummer, and at distant points the differences are less than might be expected, as shown by the following table of average temperatures :

Temperature of	Lat.	For the Month of	Highest Average.	For the Month of	Lowest Average.
Copiopó.....	37.10	January.	74° F.	June.	51.8° F.
Santiago.....	33.26	January.	71° F.	June.	42° F.
Port Monte...	41.30	January.	62° F.	June.	44° F.

The coast of Peru, though it stretches through  $19^{\circ}$  of latitude, is rainless and barren from end to end. Northern Chile retains the same character, but owing to the lowering of the Andes south of Valparaiso, and owing to Central Chile, being within the zone of variable winds, there is a gradual transition in proceeding from north to south, from a climate absolutely dry to an atmosphere so charged with moisture that rains and fogs are almost perpetual. From the following observations, taken in 1869, the increase of the rainfall,

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in proceeding from north to south, is clearly shown by the number of days in which rain fell :

	Copiapó. Lat. 27° 10'	Serena. Lat. 29° 51'	Santiago. Lat. 33° 26'	Talca. Lat. 35° 25'	Valdivia. Lat. 39° 50'	Port Montt. Lat. 41° 30'
January.....	0	0	0	1	No obs.	15
February.....	0	0	0	1	No obs.	11
March.....	0	0	1	1	No obs.	19
April.....	0	2	5	6	No obs.	5
May.....	0	1	3	No obs.	No obs.	21
June.....	0	0	2	7	10	20
July.....	0	1	5	6	21	28
August.....	0	2	5	9	15	18
September....	0	0	3	7	14	15
October.....	0	1	1	6	14	16
November....	0	0	1	3	14	14
December ...	0	0	0	3	20	23
	0	7	26	50	108 (7 Months.)	205

In 1869, therefore, there was not one rainy day in Copiapó, on the southern confine of the Atacama Desert; in Serena, which lies on the northern confine of the fertile zone, rain fell on seven days, whereas in Port Montt there were 205 rainy days to 160 fine.

The influence on vegetation of such striking climatic differences is, of course, very remarkable. At Copiapó the coast is absolutely barren; at and about Serena abundance of cacti and aloes, oxalis shrubs and a few trees besprinkle the hills; in the neighborhood of Santiago and Valparaiso, the ground is mottled with trees, and those chiefly of evergreen varieties, with thick glossy leaves; but ere Talca is reached, the zone of forest is entered; and south of that, throughout the Araucanian country, and till the climate becomes too severe to foster vegetation, dense forests of large, hardy trees clothe the country from the seashore to the summit of the Cordillera.

The influence of the rain-fall is no less marked upon the rivers. In the extreme north, the river valleys are dry from their very

sources. The Copiopó is the first river that sustains vegetation to within twenty miles of its mouth. The next principal rivers to the south, the Huasco and Elqui, fertilize their valleys at all season to the very sea ; but the country lying between and beyond the valleys is uncultivable ; for the water supply being derived entirely from the melting snows of the Andes, the arable land is confined to the narrow river bottoms. But south of Coquimbo, streams take their rise in the coast and central ranges, and rain always falls abundantly in the winter time, redeeming the country, therefore, from complete sterility. Yet it is not till the latitude of Conception is reached, that artificial irrigation can be dispensed with. The rivers of Chile are therefore all in all to her. They are small, and rush with rapid flow from the crags of the Cordillera, across the fertile longitudinal valleys and through gaps they have cut in the Central and Coast ranges. Those of the north are absorbed before they reach the sea ; those of Central Chile are rapid to their very mouths ; but there are rivers in the south that enter the ocean by broad estuaries, which will some day or other be the harbors of thriving ports.

The mountain system consists of three ranges, which are, however, very unequally developed in different sections. They all attain their greatest prominence in the latitude of Santiago. Near there the main chain rises to the towering height of 22,415 feet in the peak of Aconcagua, which is supported by other giants almost as lofty, Tepungato, 22,038 feet, and the volcano of San José, 18,144 feet high. From Santiago, as our standpoint, if we look southward, the eye travels over a fertile plain which stretches far beyond the range of vision, between high, steep mountain ranges, that enclose it at about twenty miles apart. Turning round and looking northward, we see close at hand a cross range which terminates the valley in that direction, and unites the magnificent longitudinal mountain chains. To the east are the three stupendous cones, whose height we have just given, surmounting the solid wall of the Andes, the lowest pass of which in this latitude, the Uspellata, is 11,928 feet above the sea ; while to the west, the rim of the stupendous trough in which we stand is formed of another wall of rock, which would be accounted high, were it not face to face with such a mountain mass as the main chain here presents. This, the *Cordillera*

Central, attains in this latitude an average height of about 7,000 feet, though the Robles and some of its peaks rise above this level. The Central range sinks westward into the Coast valley, called at one place the valley of Casa Blanca, at another the Acoa, and further north the Melon. Between this valley and the sea, rises the *Cordillera de la Costa* (the Coast range), much lower than the preceding, and descending, without any wide intervening plain, into the Pacific.

In these three ranges, therefore, we have three huge rock waves, decreasing in height and in distance from each other as they roll from the interior to the coast. The troughs between the ranges constitute the fertile portions of the country.

From the northern part of the province of Santiago, where the main range culminates in Aconcagua and the Central range culminates in the Robles mountains southward for 360 miles, these three ranges run with wonderful parallelism, alternating with their intervening valleys. But in the northern part of the province of Valdivia the Central and Coast ranges coalesce, all trace of the intervening valley disappears and the main valley attains its greatest width.

Further south the Coast range is submerged, its highest peaks appearing in the Chiloe Archipelago; and reluctantly the main range relinquishes the valley it has sheltered for nigh 1,000 miles to the all-devouring sea, and the great valley becomes the Gulf of Ancud and Corcovado. The glory of the Cordillera has by this time departed, the sea breaks against the base of a shattered and dwarfed breastwork and soon obliterates all traces of it as an unbroken range.

Tracing the mountain ranges northward from their culminating points in the province of Santiago, we find they stamp the northern part of Chile with a close general resemblance in configuration to the southern. The main chain, or Cordillera proper, declines in height, till in the Atacama Desert it almost loses the characters of a mountain range. From the head of the valley of Santiago, for over two hundred miles to Vallenar, it is difficult to trace any order in the orographic system, so broken and interrupted are the longitudinal chains by cross spurs and by river valleys. But even amidst

the confusion of mountains, the three ranges, with rudiments of intervening valleys, may be distinguished ; and at Vallenar (the Irish Ballenar, the native place of the O'Higgins family) commences another great plain, that of Algaroval, the representative in the north of the southern valley of San Fernando or Santiago, bounded as it is by the Cordillera to the east and a central range to the west, and extending for hundreds of miles northward, till it merges into the elevated slopes of the Atacama Desert. Between the range, which bounds this valley seaward, and the Coast range there is not as well defined a depression as the valley of Casa Blanca, but a Coast range may be traced from south to north, as distinct from the Central range. In the extreme north, however, all the prominent features of the geography of the south disappear, and valleys and ranges, instead of losing themselves in the sea, merge themselves apparently into the barren elevated plateau of the Atacama Desert, which ascends by a gradual slope from the high coast bluff to the summit of the Andes, without any marked depressions or salient lines.

The scenery of Central Chile possesses remarkably grand features, but is sombre and solemn rather than beautiful. The scantiness of the vegetation and the nakedness of the mountain sides, even of snow above the snow level, render it gloomy. Here and there only is the monotony relieved by the presence of water and fertility, and nowhere more pleasantly than along the line of the Valparaiso & Santiago Railroad. These commercial and political centres of the country lie almost on the same parallel, but separated by the Coast and Central ranges. The valleys of the Quilpue and Aconcagua rivers were taken advantage of by the railroad engineers to reach the base of the Central range, where first any serious engineering difficulties occurred—difficulties which, however, were readily overcome by the energy of Henry Meigs, who completed the road from this point, and by his success here was emboldened to attempt still much more difficult feats in Peru. The bed of the Quilpue, dry in summer, opens out upon the sea at Viña del Mar, four miles north of Valparaiso. To reach it, the road runs on shelves or through tunnels, excavated from the steep sea-cliffs. Up the valley of the Quilpue it then winds for twenty-two miles to Limache. Here it

leaves the Quilpue and passes the dividing range by a tunnel, into the valley of the Aconcagua, which it strikes at Quillota. Heretofore it has run in a general northeast direction; now it alters its course to east, and follows the Aconcagua river to Llallai. At this spot, the river and valley bend away to the northeast; but Santiago, the destination to be reached, lies to the south-east, and intervening rises the Central range at the point of its greatest elevation.

The scenery all along the line from Valparaiso to Santiago is very characteristic of Central Chile. The bare sea barrier passed, and the valley of the Quilpue entered, the train in summer time crosses and recrosses its empty bed and barren banks; but every minute affords glimpses up the steep gulches, with which heavy rains have furrowed its enclosing hills. In these gulches, perennial springs maintain perennial verdure, and nothing can be prettier than some of the country houses, belonging to Valparaiso merchants, which, with their gardens and orchards, fill some of these ravines. In this glorious climate, the trees need not be planted far apart in order that the sun's rays may reach the ripening fruit. Peach and pear trees are wrapped into one matted mass by vines, and in these sheltered nooks the palm and other trees and shrubs, indigenous to far northern latitudes, flourish. Limache and Quillota are, like all Chilean country towns, as silent as if uninhabited, and as unbeautiful and inconvenient as long rows of one-storied, red-tiled, adobe buildings, with large gateways and small windows, often unglazed, but shuttered and iron-grated, lining streets, paved with round stones, without sidewalks, but with open sewers, can make them.

The train enters the valley of Quillota from that of the Quilpue on issuing from the San Pedro tunnel, and in doing so it enters a scene of great beauty. Away ahead rises the Central range, so high that the Cordillera cannot be seen above it; but to the northeast, through the gap made by the river, can be seen the Andes, culminating in its supreme peak—Aconcagua. The broad, level expanse of the Melon valley, enclosed on both sides by high ranges and streaked with straggling villages and rows of poplars, opens on the Quillota from the left; and the Acoa valley, the continuation of the Melon, recedes to the right, the whole forming the plain inter-

mediate between the Central and Coast ranges, second in extent and fertility only to the great valley of Santiago. For mile after mile the road passes through scenery full of familiar objects in strange juxtaposition with others never seen in such society. There are long avenues of gigantic poplars, lining the roads as stiffly as in the Netherlands, and within the same *coup d'œil* palm trees, with their feathery crowns, as graceful as any on the Isthmus. In the same orchard with the pear and peach, the vine, the olive and the walnut, are the chirimoyo and the banana.

As Llaillai, at the head of the Aconcagua, is approached, the Central range stands like a wall in the way, so steep that none but the bravest engineers would ever have contemplated the possibility of scaling it with an iron road. Llaillai is already 1,280 feet above the sea; but from here, at the base of this range, to Montenegro, the summit is only eight miles, following the sinuosities of the road, yet the difference in level is 1,192 feet. On the summits rise two streams: one, the Lampa, flows eastward with a gradual descent past Tilit into the great plain and adds its waters to the Mapocha. The other flows westward, at first with gentle fall, then wildly down a gorge strewn with boulders, each a small hill in itself, till, after a short but noisy course, it joins the Aconcagua at Llaillai. Along the precipitous side of this cliff, which is so perpendicular that a stone could be thrown from the rail carriage window down the giddy height hundreds of feet into the brawling brook below, the train whirls at the rate of 24 miles an hour, here cutting off a projecting cliff by a tunnel, there running along a ledge excavated to receive it. As the summit is approached, the rock scenery becomes grand in the extreme, for beds of conglomerate of great thickness rise, step upon step, towards the crest, worn, from their varying hardness, into fantastic shapes. The contrast they present to the half-rounded outline of the porphyritic hills below, gives to the mountain scenery of this region a variety seldom seen in Chile. Looking down the gorge, as it widens into the Valley of Llaillai, flanked by hills, none of which seem willing to yield in height to its neighbors, the feeling would be oppressive did not the rapid motion and quick transition from one point of view to another produce a compensating exhilaration. There are no elements of quiet beauty such as one admires in the

nooks of the Alps to relieve the picture of barren solitude. On the contrary, rocky peaks and rocky ravines compose the landscape. But there is variety even in these rough features, for while some of the hills are wrinkled deeply and sharply, as if by age, others are furrowed by round, shallow lines as though prematurely old through constant association with their hoary sires. And in their crevices they grudgingly hold earth enough to support only the hardiest and ugliest of plants. What wonder that the people of Chile should be stolid, impassive, sad—living perpetually in the presence of nature in such awful moods.

The summit reached, we descend by gentle grades, amidst low, rounded hills with their scanty covering of cacti and aloes, the banks of the Lampa. In and out the train winds through the tortuous valleys. At one moment the Cordillera is in front, and the next we have turned our back on it and are looking seaward. The Lampa is perennial and irrigates many a patch of ground in its narrow valley, where the *enkelino's* hut is embowered in its vineyard, orchard and olive grove. Numerous holes in the hillside, which give access to gold mines, and several primitive quartz mills are passed ere we reach Tilit—*a few straggling adobe houses, but a town older than Santiago, for Indian gold workings attracted the first Spaniards to this region before Valdivia pitched upon the site of Santiago as that of the capital of the kingdom of Chile.* Tilit behind us, the valley rapidly widens. We pass to right and left spurs of the Coast range on one side, and of the Chacabuco, which separates us from the Aconcagua, on the other, ere we enter the great longitudinal valley and reach Santiago.

I spent some months in one of the recesses of the Coast range near Tilit—the little mining town above described. I enjoyed most in my rambles what every mountain traveller appreciates, the gradual expansion and unfolding of the landscape as he ascends a high range, and the delightful surprise he often experiences when a summit is reached and a glorious view bursts on him from all sides. Looking down the cañon from the *Casa* where I lived, the vast wall of the Andes, crowned by the several high peaks, over which presides Aconcagua, filled the space left by the interlocking hills, and though fifty miles off, formed a distinct background to the pic-

ture. When we ascended the eastern slope of the Cordillera Central it was exciting to watch one subsidiary range of foot hills after another stand out distinctly from the confused mass of mountains grouped about the base of the mighty chain opposite us. At last the valley of the Lampa would appear, expanding into the great central plain, and when the crest of the range was reached, a panorama of wild grandeur would be revealed, look which way we might, which impressed itself indelibly upon my memory.

One dark day in April a friend and I started in search of a peat-bog, said to exist near the summit of the range. We crossed the crest of the spur, past the *Planchada* mine, into a valley parallel with the one we had left, over bare cliffs composed of steeply tilted beds of porphyry, then through scattered clumps of oak, acacia and willows, which seemed to be a particular favorite of a beautiful parasitic plant which suffocated its victims by wrapping them in a gorgeous crimson shroud, and down a little stream whose banks were carpeted with a luxuriant growth of ferns, and which trickled through a tangle of bamboo canes, myrtles and aromatic shrubs. After an hour and a half riding, and when to all appearance approaching the crest of another ridge, a view of startling extent burst upon us.

We had reached one of the highest points of the Coast range. Looking westward, at our feet, but far, far below, lay the valley of Colliquey, occupied by a hamlet, with its green fields and orchards, and rows of poplars, but enclosed in all directions by a circle of mountains so complete that we could nowhere observe the gap by which the stream that fertilized the valley made its exit. And on all sides we looked down on a net-work of mountain ranges, interlaced and interlocked into an inextricable mass, their sides steep and bare and wrinkled deep by gullies, from their summit to their base, and crowned sometimes by a precipitous escarpment, so intricately carved as to appear from a distance like a veil of stony lace-work thrown over the mountain crest. Away to the right, rose above the others, the high peak of the Robles mountain, and near it the cleft top of the Bell of Quillota, from this point of view more like a mitre than a bell, and between it and the sea could be traced, like a narrow silver thread, the river Aconcagua winding through the val-

ley of Quillota towards the sea. A glimpse we caught here and there of the fertile valleys which alternate with the mountain chains, their yellow stubble fields contrasting with the red or purple or gray mountain sides, even more vividly than with the green of their meadows. The plains of Casa Blanca stretched away to the left, and over the coast range, beyond these plains, fifty miles away, the sea itself closed in the gorgeous view. Though the day was hazy, yet so transparent is the Chilean atmosphere, that at that distance we distinctly saw the waves beating on the headlands. There was just mist enough to mellow the landscape and soften the harshness of the outline of the hills, which are sometimes almost painfully defined.

Turning round, the scene was completely changed. Clouds filled the valleys, but above the clouds rose the summits of the hills, great and small, which cluster at the base of the Cordillera, and beyond them the blank wall of the Andes, streaked with snow, lost itself in a higher stratum of clouds, which completely veiled its peaks. As the afternoon advanced, the lower clouds cleared away and revealed to the north the valley of Tilitil, expanding into the great plain of Santiago and the high cross-range of Chacabuco, with its broad, elevated plateau, fertile in rainy seasons, closing in the Santiago valley and separating it from that of San Felipe. To the south the eastern spurs of the range on which we stood shut out any extensive view of the Santiago valley, but no intervening object was high enough to hide the 150 or 200 miles of the Andes, which could be taken in at a glance.

We could see how the range on which we stood influenced the climate to east and west of us. Clouds that afternoon hung heavily on the Cordillera side, but none on the Pacific; and, as winter advanced, snow lay deep on the eastern slope, when not a flake had fallen on the other.

On another afternoon we rode over to the same spot, amidst shifting cloud scenery that rivalled in sublimity that of the mountains themselves. Nothing can be more exhilarating than to ride out of thick mist almost at a bound into bright sunshine and watch the sea of clouds at one's feet beating against the hilltops and against the crests of the mountain ranges, which rise like islands out of the

surging waves. That afternoon we got a clearer view of the Pacific and of the vessels sailing on it than before, though the landscape at large was dim with mist. The wind was blowing off the sea, and dense clouds formed as the current of air, laden with moisture, approached the high, cold ridge of the range on which we stood. The sun, shining with a great slant underneath the cloud, fringed it with long, hanging, dark beams. Around us it was as black as when a thunderstorm is gathering, yet below the hills and valleys were glowing in the sunshine; but we viewed them through a waving sheet of dark beams, which shifted and danced like the rays of the aurora borealis.

When looking at a valley filled with clouds, it is easy to realize the period, so forcibly described by Darwin, when the elevation of the mountain system was in progress, when the tops of the present hills were islands like those of the Chiloe Archipelago and the present valleys were channels as tortuous as those of that intricate coast.

It is only for a few weeks, however, in the winter season that Central Chile enjoys the luxury of clouds and rain; and a luxury they are, the delight of which no one can realize who has not long been deprived of them. A thrill of intense pleasure ran through me one morning as I awoke, after months of blazing fine weather, and heard the rain patter upon the window panes. The Chilean Andes is not the place to seek for the most fantastic cloud scenery, but there are seen betimes grand and strange effects. At sunrise one morning, there hung at some distance above Aconcagua a few clouds which gathered into one large mass of cirrus; but a current of warm air from the south, passing along the summits of the Cordillera, absorbed it in its descent, so that for a long time the bottom of the cloud mass remained at a distance from the range, its under surface repeating in intaglio the peaks and broken outline of the Andes.

In picturesqueness, however, this solid wall of rock and its peaks, rising like watch towers above the comparatively level summit, cannot compare with the Alps and their countless groups of pinnacles of infinite variety of shape. But the Cordillera of the Andes is, above all mountain ranges, majestic in its imperturbable change-

lessness. Day after day in Summer time its features are not varied by even a passing cloud. The higher peaks of the Santiago Andes lie within the limit of perpetual snow, and in winter time snow lies upon this range almost to its base, but owing to the high wind that blows with invariable regularity and almost as invariable force, at and above the altitude of 12,000 feet snow lies only in the ravines. After a winter storm the sun will rise over a pure white range, or the glistening sheet will be broken by only a few parallel dark lines drawn across the peaks, which mark the bedding of the horizontal strata of sedimentary rocks, of which the cones were built in comparatively recent geological eras, but so long ago as to allow time for their elevation from the sea bottom to their present cloudy height. Ere the sun has set, however, the range is sure to have recovered its wonted aspect, and longitudinal streaks of snow filling the deep ravines now alternate with the exposed steeply tilted rocky cliffs. During the day, while this transformation is being effected, sheets of snow are driven for thousands of feet to leeward of Aconcagua, which look so like smoke issuing from a cleft in a crater that nothing but positive knowledge to the contrary prevents our accepting as correct the popular designation of the mountain—the *Volcan de Aconcagua*. One evening, after vacillating all day between reliance on one's senses and trust in good reasoning, as we watched the smoke reefs whirling away into space from the very crater of the cone, there flickered at the very spot a light so like the flashing flame of Stromboli seen from a distance on a dark night that it required no little effort to persuade ourselves that the smoke had been only snow and the flame was a twinkling star.

In mountain scenery the drifting snow is sometimes as productive of strange aerial effects as clouds themselves. I well remember once driving up Clear Creek in Colorado on a bright winter day when a high wind was blowing the dry snow in a thin sheet from the level tops of one of its steep sides right across the cañon. The sun was deep down in the heavens and shining from the same direction as that from which the wind blew, and thus it happened that although the trees were out of sight it threw long, ghostly shadows of firs, which grew a little back of the brink of the gorge, upon the transparent veil of snow above our heads.

The Cordillera, and in fact all the lifeless scenery of Chile, would be more dreary still were it not for the colors of the rocks. Some of the diorites are red with iron, others purple, while alternating with these and other dark tints are beds of pure white kaolin. The disintegration of the ferruginous rock gives a brick-red color to the soil, which would tire the eye extremely were there not always within glance the vivid green of laurels, myrtles and other trees with glassy leaves. These, with many grotesque forms of vegetable life, fill up a fitting foreground to the grand outline of the scenery.

The products, and consequently the pursuits and habits of the people in the North and South, differ widely, mining being the almost exclusive occupation of the North, agriculture of the South.

The line between the fertile and arid zone—or the parallel of Valparaiso and Santiago—is that which divides the mining from the agricultural section of the country. South of that parallel the coast range yields a little gold, and the Cordillera an insignificant quantity of argentiferous copper ore, and far South, at Lota, on the coast, lie Chile's coal mines; but well nigh all the silver and copper comes from the northern provinces.

The mines which yield the former are in the Coast and Central ranges. The most productive silver mines are in spurs of the Cordillera, where, when copper also occurs, it is associated with arsenic, antimony and more or less silver.

The great mines which have for the past quarter of a century supplied the world with half its copper are all but one situated at about thirty miles from the coast on dry hill-sides, difficult of access. They are not those which, after the declaration of Chile's independence, first attracted English money to be so recklessly invested in mining and smelting schemes, and whose only immediate yield was to literature, in Capt. Francis Bond Head's (afterwards Sir F. B. Head) charming little book, "A Ride Across the Pampas." A very different man, Chas. Lambert, was in charge of another English company, which, however, even his genius could not rescue from the failure inevitably incidental from injudicious interference by the London office. But when, in 1847, he was working the Brillador mine, near Serena, for himself, he achieved a very notable

success by the adoption of European methods of mining and smelting, and he taught his neighbors that ore must be extracted by the ton instead of by the pound, if mining is to be a profitable investment.

Now, the three great mining districts of Tomaya, Carrizal-alto and Chañaral—whose mines are owned and worked by associations of Chilean gentlemen, are connected each by its line of railroad with smelting works and with the coast, are supplied with the best machinery, and worked well and systematically and on a very extensive scale, yielding profit from an ore which would be despised in our Western country, and under conditions of climate and situation, though not of wages, as unfavorable as any that exist there. This great expansion of the copper trade is of recent date.

Stone implements found in old carbonate mines imply that the aborigines in pre-historic times possessed sufficient skill to reduce the ore to metal, a skill greater than that displayed by our North American Indian, who derived their copper as metal from the native copper mines of Lake Superior. In Spanish times these same carbonate ores were reduced to excellent metal, but in very small quantities, and in very primitive adobe furnaces, for in 1795 the official returns give us the total product as only 1,000 tons. In 1824 it did not exceed twice that amount. Whereas of late years it has reached 60,000 tons.

During the first quarter of a century the product of silver remained small and constant at under \$200,000, but the successive discovery of Chañarcilio, Tres Puntas and Lomas Bayas, in the desert north and south of the Copiopó, and last of all Caracoles, within the disputed zone between Bolivia and Chile, have kept the production for over forty years at above \$3,000,000 annually. Gold, on the other hand, has almost ceased to figure among Chile's products; whereas in 1790 it headed the list with \$721,754 as the amount returned to the mint as *oro quintado*, on which 5 per cent. duty was paid. Not half that quantity is now extracted. The decline in product is chiefly due to the high price of labor.

In 1865 Chile produced:

Gold.....	\$380,000
Silver.....	3,500,000
Copper—60,560 tons at \$300.....	18,168,000
	\$22,048,000

When we consider that, leaving in each case coal out of the account, and estimating iron as pig, Chile produced before the war per head of her population \$10 worth of metal; while this country, with its great West and the high price of iron and copper, produced last year per head of the population less than \$4, and Great Britain per head of her population less than \$3; when we recollect that most of this large product of Chile is derived from an ore of little value, requiring skillful and costly treatment, with much expenditure of fuel and labor to reduce to metal, we begin to realize what a mining country really is and how intimately mining must influence the whole life of the people. There not only is a very large part of the laboring population engaged exclusively in mining, but many of the farmers and farm laborers have little mining ventures, to give zest to life, while their masters, the large land-owners, are most of them also mine-owners, and every merchant in the country, great or small, has been dragged into the maelstrom, and has an indirect and too often a direct interest in mining as an *habilitador* or advancer. And mining and gambling being related amusements, the subtle influence of the former in aggravating the recklessness of the whole population must not be left out of our estimate.

Formerly miners belonged to a close guild, from which inexperience was carefully excluded. The members of it wore a peculiar dress, now rarely seen and only in small native-worked mines. But with the extraordinary demand of late, extraordinary precautions have disappeared; but, nevertheless, in manual skill, especially in single-hand drilling, the Chile miner proves a match for the most dexterous European. But with Indian aversion or inability to learn, he never acquires the knowledge necessary to timbering or laying out a straight piece of work, and therefore never rises to the position of a foreman.

In days of yore, ore was brought to surface entirely on the backs of ore carriers—*apires*—a class inferior to the miners, but whose exploits of endurance are wonderful. They still find employment in the lower levels of some of the large, and do all the lifting in all the smaller mines. The *apir* wears very little clothing, and carries his burden on his back in a wide-mouthed leather basket. The average load is 200 pounds, and this, the rule is, he is to raise 600

feet without stopping. But far heavier loads have been carried as tests of strength. Darwin mentions, as an extraordinary feat, 300 pounds being brought from a deep mine by an *apir*; but a more surprising instance of endurance was exhibited when Mr. Urmeneta was collecting specimens for the London Exhibition of 1851. An *apir* is then said to have carried to surface from a depth of 540 feet, in the Piké mine, a mass of ore weighing 350 pounds. In the native mines the galleries are narrow, crooked and often low, and these galleries, at different depths, are connected by others as narrow and low, such as, in English mining parlance, would be called *winzes*, and which are vertical or inclined according as the dip of the vein is steep or flat. Instead of being provided with ladders, the notched trunks of small trees, tied end to end by leather thongs, supplied the means of passage from one level to another. Up these notched sticks the *apir* drags his heavy load, and down them he swings himself with his empty *capaicho* at a rate which only a lifetime of practice can enable him to attain. On reaching surface he is a pitiable object; streaming with perspiration, his breast heaving, every muscle quivering, uttering a painful, wheezing, whistling cry, and apparently about to drop from exhaustion. He leans for a few seconds against the nearest support, tilts the load out of his basket and rushes back down the ladders and through the rough, uneven galleries with the zest of a schoolboy hurrying from his tasks. An accident seldom occurs, and both ore carriers and miners appear healthy. Their occupations are, however, inimical to longevity, and their habits of life do not act as a corrective.

Mr. Urmeneta, at the Piqué mine, tried to induce his miners to live in the comfortable blocks of buildings he erected for their accommodation, but they preferred their own scattered hovels of loose stones, thatched with grass, on the plea that while living in the row their rest, when they had to take it by day, was disturbed by their fellow-lodgers; but the real reason probably was that their Indian instincts revolted at houses. They are, moreover, a reckless, spendthrift race, more given to gambling than even the agricultural laborers or *peons*. And low as is the moral and social condition of the *peon*, that of the miner is lower still, despite his greater intelligence. The following table of illegitimacy, by provinces,

proceeding from the exclusively agricultural districts of the South to the exclusively mining districts of the North, speaks for itself :

Colony of Megallanes.....	1	illegitimate to 8.75	legitimate.
Province of Chiloe.....	1	"	8.40
Colony of Llanuehue .....	1	"	5.85
" Valdivia .....	1	"	3.89
" Arauco .....	1	"	3.30
" Concepcion .....	1	"	2.76
" Nuble .....	1	"	3.93
" Maule .....	1	"	3.33
" Talea .....	1	"	4.77
" Curico .....	1	"	5.04
" Colchagua .....	1	"	5.89
" Santiago .....	1	"	4.30
" Valparaiso .....	1	"	3.94
" Aconcagua .....	1	"	3.13
" Coquimbo .....	1	"	2.74
" Atacama .....	1	"	2.42
Average.....	1	"	3.75

Some special causes to which this unfortunate state of morals is attributable are curious. One cause, which illustrates the persistency of inherited habit, is, that there is among the upper classes an unusual demand for wet nurses, owing to the fact, it is alleged, that in the old colonial days the Spanish lady would not nurse her child, and now her descendant cannot. Another cause is found in the shifting character of the population of the North. A silver mining region is one year flourishing and the seat of a large population, and the next deserted. And, at any rate, the miner there, who has no proprietary interest in a mine, is like the miner here, restless and always changing his abode. The wife consequently has not such control over her husband as in a settled community she would have, and, therefore, she prefers holding him by bonds of preference rather than in legal shackles, out of which he could so easily slip by merely seeking employment elsewhere. Respectable women, there-

fore, prefer to remain unmarried rather than run the risk of alienating their partners by demanding a bestowal of their rights and then attempting to enforce them.

Chile has always been the granary of the West Coast and of Buenos Ayres, though the export of cereals, till recently, has been trifling. The following extract from Don Juan de Ulloa gives a curious picture of the trade a century ago, and describes Valparaiso as a very insignificant place—a mere trading mart like Portobello on the Isthmus—visited periodically by a shifting population: “The nearness of Valparaiso to Santiago,” he says, “gives it the commerce which formerly belonged to Concepcion. This circumstance peoples and maintains it, and is the cause of its rapidly growing prosperity. At present the whole Callao fleet, carrying on the trade between Peru and Chile, meets here. Usually the ships arrive empty, for their only cargo on their southern trip is the few productions of Peru consumed in Chile; but they return laden with wheat, tallow, hides, dried meat and fruit. There are ships which in the course of the summer—that is, from November to June—make three voyages. During the intervening months the owners of the *haciendas* and the wagoners are busy refilling the empty stores. Thus traffic is continuous by sea and land.”

“The ship owner, whose establishment is invariably in Lima or Callao, forms a partnership with the *haciendado* of Chile, and the cargo carried in his ship is sold on joint account. But occasionally shipowners take the produce at a fixed freight, which amounts, if the cargo be wheat, to more than its value, for the fanega is not worth more than 10-12 reals (a trifle more than it is worth in Concepcion), while the freight amounts to from 12 reals to 2 dollars, and sometimes more. The value of the wheat is, therefore, in Callao (the fanega being there 5 arrohas and 5 lbs., and not 6 arrohas as in Chile) from 24 to 31 reals. As the trade is confined to the summer months, it is then only that Valparaiso is crowded, for so soon as winter sets in most of the summer population returns to Santiago and there remain those alone whom business engagements detain.”\*

\* Don Jorge Juan and Don Antonio de Ulloa, *Relacion Historica del Viage a la America Meridional*, Madrid, 1748, Vol. 3, page 366.

When the revolution threw trade open to foreign competition, Valparaiso took a rapid stride—too rapid, indeed, at first. For English merchants so flooded the market with English goods that many articles sold in Valparaiso at less than their cost price, and thus it happened that between 1820–31, there occurred a period of almost retrogression. But since then the progress had been rapid and unchecked. The population in 1820 hardly reached 5,000.\* In 1865, there were 68,964 residents, and a floating population, according to the official census, of 1,474. Of the residents 4,961 were foreigners, the principal components of this number being 1,044 English, 963 Germans, and 799 French.

The railway between Valparaiso and Santiago and that from Santiago southward towards Chilean, by giving an outlet through Valparaiso to the agricultural productions of the Central valley, benefitted it so notably that from 1855–1866 the population increased 41.9 per cent. But it may happen that when the railway shall be completed to Chilean, where it will connect with the Chilean & Talcuhano road now open, another outlet being given, Valparaiso may cease to monopolize the trade. One cannot help thinking that Concepcion will one day or other win it back in part from its successful rival, for sooner or later the intrepid Araucanian Indian must yield to firearms and civilization, and the hundreds of squares miles of fertile country he has withheld for centuries from imperial Spain and republican Chile must be added to the arable land of the Republic. At present the Araucanian Territory cuts the country and the Central valley in two. The Santiago & Chilean R. R. runs to its confines, and then turns at right angles to the coast at Concepcion and Talcuhano. Were this hostile barrier not interposed, the Southern Railway might run to Port Montt, a thriving colony of German immigrants in the part of the Republic south of Araucania, where the Central Valley terminates in the Gulf of Reloncavi. When this will take place, Concepcion will be midway between Santiago and Port Montt, and more favorably situated, therefore, by far than Valparaiso as a shipping port for the cereals of the valley of San Fernando, then open from end to end for a distance of 500

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\* John Mier's *Travels in Chile*. Vol. 1, page 446.

miles. What that great valley may ultimately produce it is impossible to calculate, but we know what a part of it is yielding now. Till 1848, Chile raised only what wheat sufficed to supply Peru and her own wants; but then California offered so favorable a foreign market that Chile was tempted to take advantage of it. In that year California took from her \$52,383 worth of cereals, and in 1850, \$1,427, 955 worth. But by that time California had commenced to grow wheat for herself, and her demand on Chile so rapidly fell off, that in 1856 it ceased altogether, and by 1860, California exported as much as she did. But the Californian trade had awakened Chile to a consciousness of her resources, for in 1848, beside what she exported to California, she shipped to England \$90,600. This beginning was trifling, but the trade rapidly assumed greater proportions. In 1860, there were exported \$3,604,685, of wheat, and in 1873, the shipments had swelled to nearly treble that amount, viz., \$11,347,599.

If we take together the exports of her mines, wheat fields and mountain sides, we find that this little people of 2,000,000 souls supplies the world with \$36,000,000 worth of necessities, in the form of gold, silver, copper, cereals, hides, tallow, dried meat, honey, etc., or \$18 per head of the population.

General education has, however, not kept pace with the growth of material prosperity. The upper strata of society, through wealth, education and foreign travel, are refined and liberal minded; but although there is a good university, where men of eminence, especially in science, teach; as well as lyceums, technical schools and common schools; abundance of well-written newspapers and periodicals and a very fair body of native literature of a more permanent kind, these elevating influences have not reached the mining and agricultural population, who are ignorant and superstitious, and whose habitations and modes of life are as primitive as though they had never emerged from the savage state.

What influence the war will have it is difficult to predict. The army has been drawn from the lower strata of society. These miners and *peons* have gone out into the world under circumstances likely to teach them their power and to whet their wits to the uttermost. Will they return to their old enkelinage or will they not, like the Russians after the late war, want to try some of those

visionary and impracticable theories of which they will have heard so much in Lima, from which their leaders in the past have so sedulously endeavored to protect them, and which, though they have wrought so injuriously for their enemies, are not the less fascinating? I think this will be the direction of change. If the people are fit for it, the change will be for the better. One result of a liberal policy will be opening up the great southern country to emigration. The Church, both in Peru and Chile, has opposed any but Catholic emigration. German colonists of Port Monte are chiefly Bavarians. The South is a congenial home, climatically, for emigrants from northern Europe. If they enter, there is not likely to be a serious retrogression towards the license of radicalism, while at the same time they will resist any approach towards absolutism.

At any rate, Chile owes half a century of good government to her oligarchical rulers. Disapprove as we and their liberal opponents may of some of their principles and practices, they have made their country trusted and respectable abroad. They have shown the world that at least one South American republic is governed without fraud and without violence. And at home they have held control, through the constituted legislative and executive channels, and taught all classes that liberty need not of necessity degenerate into anarchy; though at the same time they have proved, what we know to be possible from experience nearer home, that the essential liberties of the citizen may be respected by the party in power, while it is indulging in a very wide latitude of political license.

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## THE WATER-WAYS OF NEW YORK.

BY DR. ISAAC I. HAYES.

Within the valley of the Mississippi dwell about thirty millions of people. Those of the two rivers which drain China, united, amount to 1,200,000 square miles, and contain a population of four hundred millions of human beings. The valley of the Danube, which has been the granary of Europe for centuries, embraces an area of 234,000 square miles. Next to these we have the valley of the Volga, which—not the Volga itself, but the branches that run parallel with it and discharge into the Caspian sea and the Sea of Aral—embraces an area of 363,000 square miles. This, in ancient times, was the seat of the most prosperous commerce, or the scene of the most prosperous commerce, that the world has known until the present time. We have then that vast population of India, drained to the ocean through the Ganges and the Indus rivers; the Ganges, teeming with an ancient and at one time highly civilized population, drains an area of 420,000 square miles, and the Indus a little less than 400,000 square miles. The largest drainage in the world is that of the Amazon, which is not less than 1,527,000 square miles. Yet the valley of the Amazon yields subsistence to a very small population, only a little of which is civilized.

I mention these simple facts in order that I may indulge my fancy a little in calling your attention to those great centres of industry and civilization that have marked the history of the world.

The Alleghany range of mountains stretches parallel with the coast, having an average altitude of 2,500 feet, and is broken through only in one place, and that place is in the State of New York. The highest elevation in this breakage of the range is only 427 feet above tide-water, and that is the valley of the Mohawk river, a branch of the Hudson. The vast and fertile country lying beyond the Alleghany mountains early attracted the attention of the fathers of our country, and even in colonial times Washington recommended the Government of Virginia to appropriate the money necessary to connect the eastern slope of the Alleghanies with that vast and

unknown region beyond by canal—water communication being, at that time, the only communication known, except by horses, by mules, by carts, and similar mechanical contrivance on land. The project was subsequently supported by Jefferson, about the same time that Louisiana was obtained from the French Government for about fifteen millions of dollars, the most happy circumstance that ever occurred in the history of this country, for it gave us 6,400 square miles of territory, to say nothing of the Rocky Mountains, and the slope westward to the Pacific Ocean. Canals were undertaken grudgingly, at first, and the base of the Alleghanies was reached, but the most of the territory was beyond the limit of water communication, and only to be reached by wagons. The need of communication was advocated in Pennsylvania by Franklin, and other men conspicuous in the history of that great and prosperous State; but at no time was successful communication made with the West until the time of De Witt Clinton—a great man—and we may say that to him New York, as a commercial and prosperous State, owes its existence. He was the private secretary in 1794 of the first Governor of the State, who was his uncle, George Clinton, and his attention at that time, while a young man of nineteen, was attracted to the importance of connecting the East with the West, and from that time on he urged the necessity of communication between the two great sections of the country, and, at the same time, recognizing the break that gave to New York its position, he pointed out the fact that through the break communication was possible. Canals at that time were going forward in England and on the Continent at a great rate, but De Witt Clinton projected a system rivaled only by those of Holland and China. He had the satisfaction of passing over the range in 1810, traveling from Syracuse to Utica by the Mohawk river. Schenectady was then only a straggling little town with fifteen houses and three stores—a city now of large population and extensive manufactures. Utica consisted of fifty houses, three grog shops, five stores and one hotel—a city now of fifty thousand inhabitants and prosperous as a manufacturing town. Rochester and other towns were only small hamlets in that year—1810. De Witt Clinton finally became Governor of the State, and in 1823, after a life spent with this one object of creating a canal system for the

State, he had the satisfaction of seeing formally opened by the State a route connecting the headwaters of the Hudson river at Albany—or Troy—with the waters of the Lakes. And I hold in my hand here—something which you all cannot very well see—one of the original placards posted from town to town along the line of the canal, announcing its opening. The telegraphic signal was the firing of a battery, which sound was taken up from town to town, from village to village, from city to city along the entire line, when Governor Clinton was making his way in the first boat that passed from Lake Erie to the Hudson. I fancy this is almost the only poster of that kind in existence, and is of such interest that I give it entire.

### CELEBRATION

*Of the Passage of the first Boat from the Grand Canal into the Hudson, at the City of Albany, on Wednesday, October 8, 1823.*

#### ORDER OF ARRANGEMENTS.

1. A National Salute to be fired at sunrise, and the bells to ring. At which time the joint committee will proceed to the junction of the Erie and Champlain Canals, and there join the Canal Commissioners and Engineers on board a Canal Boat; from thence down the canal. On their arrival at the Basin at Gibbonsville, they will be received by another Boat, with the Military Association and a Band of Music on board. The two boats with such others as may join them, will then move on to the city of Albany, where they will arrive at 11 o'clock.
2. The different vessels in the harbor to be dressed with flags, and moored in a line in front of the Basin.
3. A Band of Music to be stationed opposite the Lock.
4. The Artillery, with field pieces, to be stationed on the Pier in front of the Lock.
5. A detachment of Artillery, with heavy field pieces, to be stationed on the high ground west of the Lock.
6. The State and Municipal Authorities, Military, Societies and Citizens will assemble at the Mansion-Houses at 9 o'clock, A. M., and will be escorted to the lower Lock by the Military.
7. At 11 o'clock the Top Stone of the Lock at the termination of the Erie and Champlain Canals, will be laid by the Grand Chapter of the State of New-York, according to masonic rule.
8. When the first boat passes into the Hudson, salutes to be fired by the Artillery on the pier and high ground, during which National Airs to be played by the Band, &c. and the boat will be taken in

tow by twelve Yawls, each manned by a Captain and six oarsmen, and proceed down the Basin into the river, and thence round to the head of the Pier.

9. After the landing of the Canal Commissioners and other gentlemen from the Boats, a procession will be formed in the following order—

MILITARY, under the command of Major-General Solomon Van Rensselaer, Marshal, assisted by Major R. I. Knowlson and Capt. John Koon, in such order as the Marshal shall designate in General Orders.

Sheriff and City Marshal.

Common Council and Committee of Arrangements.

CANAL COMMISSIONERS.

Engineers and Assistant Engineers.

Commissioners of the Albany Basin.

Canal and Basin Contractors.

Rev. Clergy.

The Governor and Suit, Lieutenant-Governor, Chancellor and Judges of the Supreme, Circuit and United States Courts.

Senate and Officers.

The Heads of Departments.

Members of Congress and Civil Authorities of the United States.

Officers of the United States Army and Navy.

BAND.

Military Association.

Fire Department, including Engine, Hook and Ladder, and Axe

Companies.

SOCIETIES.

Cincinnati.

Grand Chapter of Royal Arch Masons.

Society for the promotion of Useful Arts.

Albany Lyceum.

St. Andrew's Society.

St. Patrick's Society.

Mechanics' Society.

Cordwainers' Society.

CITIZENS and STRANGERS.

10. A signal gun will be fired by the Artillery on the Pier, when the procession will move under discharges of Artillery, through North Ferry, Market and State-streets, to the Capitol Square. The bells will ring during the moving of the procession.

*Ceremonies to be performed in a Pavillion at the Capitol Square.*

11. An address to the Throne of Grace by the Rev. Dr. Chester.

12. His Honor the Mayor, in behalf of the Common Council and the Citizens of Albany, will deliver an Address to the Canal Commissioners, on the successful completion of Canal Navigation to the city of Albany.

13. National Air by the Band.
14. Benediction by the Rev. Mr. Leonard.
15. A Feu-de-joie by the Military.
16. Fire Works to be exhibited in front of the Capitol in the evening, to commence at 7 o'clock.

CHARLES E. DUDLEY,  
ESTES HOWE,  
JAMES GIBBONS,  
EBENEZER BALDWIN,  
FRIEND HUMPHREY,  
JOHN CASSIDY,  
COENRAD A. TEN EYCK,  
HAWTHORN McCULLOCH,  
HENRY W. SNYDER,

WILLIAM JAMES,  
JOHN STILWELL,  
JAMES B. DOUGLASS,  
SAMUEL A. FOOT,  
JOHN N. QUACKENBUSH,  
PETER GANSEVOORT,  
ISRAEL SMITH,  
JOSEPH RUSSELL,  
SOL. VAN RENSSELAER,

*Committee of Common Council.*

*Committee of Citizens.*

I mention these facts, trite as they may be, for the purpose of calling your attention to the life of our Empire State; and what I mean by this is, that the State of New York has the Erie canal, and the Erie canal has made the State what it is.

"The Water-ways of the State of New York in their Relation to its Commerce" is the title of the address which I am to deliver this evening. Now, the watershed of which I have been speaking includes the whole of the State of New York, except the small portion of it lying on the western slope of the Alleghany mountains. Pennsylvania lies largely within it and contains great mineral wealth—iron and coal, and more lately have been discovered large quantities of petroleum, creating a new industry that from Pennsylvania has spread out over the earth, and is one of the large items of export that make up our credits to the commercial centres of Europe and all other parts of the civilized world. The harbor of New York is perhaps more beautiful than any other in existence. In it all the navies of the world might lie at anchor at the same time and not be crowded. Passing by that, the traveler from Europe comes to this Island of Manhattan. The Dutch, in passing here, had carried on some barter with the natives, and, before leaving, filled their calabashes with gin which produced such remarkable effects that the Indians named the locality *Man-hat-tan*, which

simply means "the place of drunkenness." Such is the Indian name. I mean no imputation or reflection whatever. Passing up the river, we come to historic places like Dobb's Ferry and Verplanck's Point, and at Tarrytown you may take a glimpse into the revolutionary history and see the spot where one was taken who held within the hollow of his foot records that would have sold the country to the enemy—I allude, of course, to the capture of André. Passing on from this you come to Sunny Side, and you may, perhaps, get a glimpse into the little place where lived Washington Irving, whose magic pen pictured the region round about, telling us the legends of the Catskills and of Rip Van Winkle. Passing on we see those kings of the Hudson, the Donderberg and old Cro' Nest. Going further up to our right are the Berkshire Hills of Massachusetts, and far away the remote peaks of the range we know as the White mountains, and so on until they run right into the valley of the St. Lawrence. Turning our faces now to the south, there is to the west the Alleghanies—or Appalachian range, to speak more definitely—of which nearest to us is the branch called the Catskills, the most romantic mountains in the world as you see them dyed purple by the setting sun. North of them is the Helderberg group. In New Jersey the Appalachian range is known as the Blue mountains; further to the south as the Cumberland, the Blue Ridge and Black mountains; and finally the range dies away in the blazing slopes of Georgia and Alabama.

I have tried to picture this range of mountains, because in one place, and one only, and that is by the valley of the Hudson, at Albany, and through the Mohawk river, you have the only break that occurs between the St. Lawrence and the savannas of Georgia and Alabama. It was the genius of De Witt Clinton that first conceived the idea of availing himself of the opportunity to drain the waters of the great lakes into the Hudson river. At the time of this conception of De Witt Clinton, New York was less in value than Virginia or Pennsylvania. If I can light here upon the figures I will give them to you, as to the relative value or proportionate value of these three several States.

At that time the population of Virginia was the largest of any State in the Union, that is to say, 880,200; the second State in importance was Pennsylvania, with a population of 602,365 and the

third was New York, with a population of 589,051. This was the condition of New York at the beginning of the present century. In 1875, when our last census was taken, New York had a population of 4,705,208, a gain of 702 per cent. within the century. At the same time, the population of Virginia, including West Virginia, had grown to 1,607,177, being a gain of 90 per cent. only in the century, as against New York's 702 per cent. We might call these results of masterly inactivity on the part of Virginia and of activity on the part of New York; but I claim that the marvellous prosperity of the State of New York is due simply to the circumstance that the Erie canal was opened through the State, where the valley of the Mohawk is only 427 feet above the level of tide-water, due entirely to the fact that De Witt Clinton, recognizing the importance of draining the products of the Western country into the Hudson and thence to the seaboard, created the possibilities of our State through artificial means. New York, therefore, is an artificial State, made by artificial methods, and owes her existence solely and simply to the fact that she fills the only gap in the Alleghany mountains. The products of the State of New York could not to-day feed one-fourth of her population. I will not tire you by detailing the products of the State, as I have the figures before me in the census of 1875, but I will state one fact: The amount of grain produced by the State—which was at one time the best wheat-producing State in the country—in 1875 was less than 10,000,000 of bushels and would not sustain one-fourth of the population of the State. That is to say, the entire product of the State, in the way of grain, would not feed Manhattan Island. The State, therefore, owes its prosperity to its transportation. Its transportation began with the opening of the water-ways—that is to say, of the Erie canal and the Champlain canal. The former was originally intended more to connect growing centres of traffic and of manufacture, such as were Syracuse and Rome and Rochester, than with any idea of a more ultimate advantage to grow out of what might come. People settled by its banks, and with marvellous rapidity, such as nowhere else has been known. Little Falls, Schenectady, Rome and Rochester grew into important towns or cities, and when railroads were invented by the genius of Stevenson, in England, and were consummated in this country, little branch railroads were built to connect the

towns or cities which the Erie canal had created. New towns sprung up, and by and by there was a through line of railroads between the Lakes and Albany and along the Hudson river from Albany to New York, and the consolidated great road which connects these great cities to-day was created by the water-ways which had created the cities.

You have all heard the story of the boy who asked his father how it was that every great city had a river running past it. The truth is that all the commerce of the world, that exists now or has ever existed, has been transient when carried on by artificial means, and permanent if by water transportation, which point I propose further to illustrate. The water-ways of the world are the permanent highways of its commerce. Overland transportation of products, by whatever means conducted, is temporary, fleeting, and purely to serve the purposes of the time. The water-way means everywhere commerce, and the commerce of New York is the Erie canal. The Erie canal made it the fashion of this great western country to come to New York. The railroads, when they had been built, using the opportunity, came by parallel lines and profited thereby. The New York Central and the Hudson river roads were supplementary to the canal, and if the Erie canal were wiped out of existence to-day, the Hudson River Railroad would not pay dividends upon its bonds, for the simple reason that the longest way for the products of the great West to reach the seaboard is by the way of the New York Central road. It is seventy-one miles nearer by the Pennsylvania to Chicago than by the New York Central or the Erie. These roads, then, are simply conveniences of commerce—adjuncts to the water-ways of commerce.

There are three stages in the history of this canal which we owe to the genius of De Witt Clinton. The first embraces the period following the completion of the canal, when it was only four and a half feet deep, forty feet in width, and intended to carry only vessels of seventy-five tons burthen. The second period began in 1835, when it was widened to seventy feet, and deepened to seven and a half to nine feet, but the least depth was seven and a half feet. This was not completed until 1862, and then the boats, from being an average tonnage of seventy-six tons, reached a maximum of three hundred tons and an average of two hundred and twenty tons.

The traffic kept pace in growth with the improvements, and the line of communication through the State being made the fashion by the canal, the latter gave its surplus to the railroads, and they prospered. Now, the third stage of that canal has recently occurred, and the fourth will occur within a short time. The Constitution of the State of New York requires that the water-ways of the State mentioned in the Third Section of the Seventh Article of the Constitution—mentioning particularly the several canals, that they cannot be legislated out of existence—requires that the expenditures for canal purposes in any one year shall not exceed the receipts of the previous year, and they are known, therefore, as the Constitutional canals. The receipts are from the tolls levied upon the grain and other produce that passes over the line. This has been found by the managers of the canals to be a serious incubus upon their prosperity. They are limited in their expenditures, not only for the necessary repairs but for any breakage that may occur in the canals. There is a little which the Constitution provides for. Now, I have had a little experience during the past six years in legislative matters, having for that length of time been sent from the district in which this hall is placed as the representative of the richest commercial body of any in the State, and foreseeing the difficulties, and having given a good deal of study prior to that time to the canal question, I came to the conclusion, in 1878, that a free canal was essential to the business interests of this great metropolis, and accordingly I introduced a measure into the Legislature, which received but little favor at the time and was defeated ignominiously. I introduced it again the following year and never lost sight of it, and I have the satisfaction now of knowing that, having conceived this bill—myself writing the amendments to the Constitution—and pressing it for four years, I have the satisfaction now of seeing the two political parties, Republican and Democratic, each putting a plank in the platform of its party, each trying to get the best of the situation and striving and recommending to the people a free canal policy; and I have the pleasure of knowing that my own conception has passed both branches of the Legislature without a dissenting vote; and I have the satisfaction of knowing that I have not only accomplished a purpose, but have created a State policy. The next stage will be—and that will come while many of us are

still living—a ship canal between Buffalo, Albany and New York. That will be the fourth and last stage, but the longer we live the more prosperous we shall see our water-ways become, and if no one else will do it I will volunteer myself to do as I did with the free canal policy; I will go to the front for the ship canal policy. Now we have here a matter that I can entertain you with—if I can entertain you at all—and that is the Welland canal. When we built the Erie canal we made a great mistake that we did not enter Lake Ontario with another canal connecting that lake with Lake Erie. The Canadians have the best of us, as they will, when it is completed, have a canal which will admit thirty feet of water, which is one hundred and ten feet wide, and which will let in vessels of two thousand tons, laden with grain at Chicago, and without any transhipment of its freight, carry it over the watery highways of the world to London, to Liverpool, or anywhere else. We have in that a great rivalry.

I have said that our State is an artificial State. New York city is a purely artificial city, on an island by the sea. She has no back country, she has nothing to support herself and she is as artificial as was Venice, the city of a hundred islands. She has scarcely in history a parallel as artificial in all that we know of ancient or modern times—a simple city upon an island. And whence does she draw her wealth? It is from that vast area of the West, which, as I have told you, embraces 92,400 square miles, which you enter by the Erie canal. Passing on the west side of the Alleghanies, now you strike Pittsburg. Follow along the valley of the Ohio and you reach its junction with the Mississippi proper, and down that we pass to the entrance of this Father of Waters into the Gulf of Mexico. Now, here has been a cunning man at work trying to destroy our business. He has built jetties at the mouth of the Mississippi river, and by the scouring process of the flow of water that has pressed through these low and malarial banks he has scoured out a depth of thirty feet, and the largest ships of the world can now find entrance into New Orleans; and we find a very large portion of the drainage of that great valley going down the river now, by reason of inventions that have been made that will protect the grain grown in the sub-arctic regions of Minnesota and Wisconsin from molding—which could not be done until within a few years—when brought into the semi-

tropical region of New Orleans, where it can be shipped. And thus we find the natural drainage of the Mississippi river going little by little away from us and our artificial drainage. It is steadily leaving us, and at the same time strenuous efforts to take away our trade are being made by the Canadians, through the St. Lawrence river. I will not cite the figures, but the commerce of Montreal in the drainage of the great West, has trebled within the last four years. It therefore becomes us to be careful in the encouragement that we give to the transportation interests of the West, and here it becomes us as a State to take under our care more than we have hitherto done the railway interests which, mistaking their calling, would wipe out the Erie canal, and by wiping it out throw the traffic into Pennsylvania, which can transport by rail cheaper than we can; and with that end in view, using what little public experience I have had, I have brought forward in the Assembly, but which unfortunately was defeated in the Senate, a bill providing for what I believe every man in this audience will agree with me has come to be a necessary business of the State with regard to its transportation interests—that is to say, the creation of a Railway Commission to superintend these roads. I think I may say that all the evil that was done by the false system would be rectified by this commission; and I think I was the first to suggest the remedy, which has met with much opposition; but I may say the president of the Erie Railway, Mr. Jewett, has given his cordial and hearty approval to the plan for a Commission to supervise such an important interest and stand between the interests of the companies and the interests of the State. We have given these companies too much, and no one can look at any railroad in the State without beholding a corporation that is, substantially, at least, irresponsible to the State that gave its franchise. I mention these facts only because they are vital to us here. If New York were beside a great river, as St. Louis is, it could take care of itself; but we must take care of New York. I have pointed out to you the great railroad system of our State. The system extends westward, and, strange to say, the westward transportation, which has given our system its value and its advantages, is across the natural system of drainage and contrary to the known rules of the movement of commerce. There is only one instance parallel to it in the history of

commerce, and if you will permit me I will use it as an illustration. This we find in the valley of the Euphrates in Asia, and in ancient times. There was precisely the same artificial course of transportation there that we find in use in our own time in our communication with the West. We cross the Mississippi Valley and draw by rail at right angles to it the products that would naturally go down that great waterway and its tributaries. Just so in olden times the products of Asia were carried across the water-sheds. The drainage of the valley of the Volga, which flowed into the Caspian sea and the Sea of Aral, were carried westward through Mesopotamia and across the valleys of the Euphrates and the Tigris, building up the great cities of Nineveh, Bagdad, Babylon and Damascus, and finally reached the sea at Sidon, Tyre or Byzantium, which subsequently became a great Roman city; and thence they were distributed by merchants through the ports of the Mediterranean. This built up Carthage and the vast system of cities that extended along the northern shores of Africa. In the course of time, these, as you know, fell, first into the hands of the Greeks and then of Rome, which was mistress of the world—how small a portion of it, she did not know. When vast hordes of barbarians left her proud palaces a waste of smouldering ruins, there grew out of that a new world; but darkness reigned over the commerce of the world for a long period of time. I come back now to the crossing of this system of transportation. I need not call your attention to the wealth and splendor of Babylon; I need only call your attention, as we are talking of commerce, to the fact that the fall of Babylon was not due to her luxury or her splendor; it was not the baseness to which her government was reduced which caused her fall; she fell into decay simply because the cunning Arabian merchants, crawling round the Persian gulf, carried the products which came by the Volga and the Caspian sea down through the Persian gulf, through the Arabian sea and the Red sea to Suez, whence it was carried across the isthmus to the Mediterranean. The caravan routes fell into disuse, those mighty cities declined, and the whole of Mesopotamia became in consequence a waste and wilderness, and the Alexandrian ports in the time of Cleopatra grew into magnificence and outshone the splendor of Babylon. Why? Because the wheat and corn and the products

of Egypt and India passed through her hands and paid toll to her. Finally, the Greek merchants got possession of the traffic, and then the Venetian merchants, revelling in their wealth and glory, founded there in the Mediterranean on the Hundred Islands, the most wealthy mercantile community that has existed in modern times. I am simply tracing now the water-ways of the world, and I use this as an illustration, "to point a moral and adorn a tale." Venice, the richest city of any time, next to Babylon—Venice fell during the Crusades. And why? There was one way only to break the back of the Saracen, and that was to cut off the great commercial interests that were pouring in by the Isthmus of Suez; and Pope Nicholas XII. in 1294 issued to all the crowned heads in Europe a letter asking, but not commanding, that they should recommend to their subjects that they should cease traffic with the Saracen, and the Asiatic trade in the latter part of the 13th century was cut off, and darkness worse than polar night weighed down the mind for centuries. But Venice, which up to that time had controlled the commerce of the Mediterranean, sought a way round Africa to reach India. In this she failed, but in the progress of this enterprise there sprung up in Portugal a prince who founded his observatory at Cape St. Vincent and invited the wise men of the world to come there and receive instruction, and among them were Vasco de Gama, a noble representative of Portugal, and Columbus of Genoa. The latter conceived that he could reach Asia, the land of untold riches, by sailing west a distance of 4,500 miles, and so sure was he that he had attained the goal of his hopes, that on his second voyage he required an affidavit from all persons on board his fleet that they believed the coast of Cuba, along which they had sailed, was the coast of Asia. His own belief needed no confirmation, for he was sure Hispaniola was the real Ophir from whose rivers Solomon had once obtained his gold, and that the extremity of Cuba was the southern cape of Asia, by doubling which he could sail along the known coasts of India to the Red sea, and from thence return by land to Spain, thus completing the circuit of the globe. Even to the day of his death he never knew he had discovered a new continent, the existence of which was not demonstrated till after the conquest of Mexico, when Bilboa, September 25, 1513, from a mountain summit on the Isthmus of Panama, descried the Pacific ocean, separating America from Asia.

I mention these historical facts simply to draw attention to the value of the watery highways and to impress upon you the necessity of their enlargement within our own State; for it is the watery highways of the State—the Hudson river, which breaks over the Alleghany range, and the Mohawk, which breaks again through the upper portion of that range—that gives us our prosperity, and against all natural reason the drainage of the valley of the Mississippi ; and that drainage extends, by these artificial lines, 4,000 miles above the mouth of the Mississippi itself to the very base of the Rocky mountains, to the wildest passes, even whence at the present time are brought products which find their way through the canal to the ocean, and are distributed through the waters of the ocean to all parts of the world. I say that we should encourage this and we should not lose sight of it. It has been my purpose here to-night to call your serious attention to the matter, and to ask you not to forget it when it shall come before you either in legislative action, or proposed action, or through anything that may happen to call public attention to this matter.

And in this I come down to our own city, which I have said was an artificial city, a city on an island by the sea. And here I would speak a word with our merchants. They are largely interested and concerned in the welfare of this great city, a city destined in time to be the largest in the world ; a city which substantially holds in its population Jersey and Brooklyn as parts of New York. Round our matchless harbor we have more than 2,000,000 of souls. I would find fault with the merchants for this, that they are sometimes a little wanting in public spirit. You may go to Liverpool or London and place your ship in dock there and give your cargo into the keeping of a consignee ; and if you are under orders to go to Europe, to Australia, to Cape Colony, or any other part of the world, there are warehouses on the other side of the dock in which your ship is floating from which you may obtain any possible cargo you may want in eight-and-forty hours. You go down along the North river and what do you behold there ! Not a line of bulkheads of stone, where no docks at all are required, but simply bulkheads of cribwork, or anything at all that will allow a ship to lie inside, meeting the eye of the shipper with disgust and the eye of the taxpayer with something that takes some more strong expression than simple dis-

gust. We have no need for docks, because we have no tide like Liverpool, where it rises 14 or 15 feet. The rents are too high, our harbor dues are too great in many cases, our pilot charges are too great, our dues for quarantine are too great. With all due respect, I must say that everything that man could desire to drive commerce away from the port of New York is done by merchants, or at least by the laws of the State of New York, against which the merchants do not protest. We should do everything in this great city to encourage commerce, not to drive it away. They are wiser in Philadelphia and Boston and Baltimore than here. Many vessels come here, discharge their cargoes and go away as far as Baltimore in ballast to get a cargo to carry to some other part of the world. Why? Because they are afraid of our high charges here. I have spoken of the docks—of the immense amount of money that is squandered for no purpose whatever, and yet we have not dockage for the ships that come to beg the poor privilege of giving us the benefit of their trade. Go along West Street and look on your right, and what do you find there? Miserable little horse railroads monopolizing the seat of commerce, instead of the steam railroad that Boston has built, connecting her Long wharf and her Indian wharf! And what do you see on the left-hand side as you go along? Petty stores, where second-hand goods are sold, and numerous small gin-mills! Is there a single first-class store there? Where are the warehouses that should line the street? Can any ship at Pier 41, Pier 28, pier anything on the North river, look around her and find a cargo? She must hunt all over the city if she wants an assorted cargo of goods. I say the ships of the world that send their goods here to New York do it every time under pressure. If they could go anywhere else they would not come here.

There is among the New York merchants a lack of public spirit which is exhibited in sometimes expending their care on trivial matters which should be devoted to affairs of much greater importance. I think we have too little pride in our institutions. There is no city in the world that has so many beneficent institutions. Look around and see, for instance, the asylums for juvenile delinquents and the care bestowed upon them. You may take the Reformatory under the care of Protestant denominations, or you may

take the Catholic Protectory as illustrative of our public spirit in all that relates to the humanities of life; but in that which concerns our public business it looks very much as if our motto was "every man for himself and the old boy take the hindmost." This lack of public spirit is detrimental to the growth of the city, but the city grows notwithstanding. It is the healthiest city in the world. The death rate is only 29 in a 1,000 to 32 in Philadelphia and Boston, and 29 to 41 in the town of Dayton, Ohio, in which I have lived. Why is this? It is because we are situated upon an island. We have the sea breezes continually, and, despite our bad management, we have commerce from every quarter of the world. All we want to do is to give it welcome, that welcome which we neglect to give to the health-giving breeze that gives us life. We neglect the commerce of the world that is so ready to pour itself into our lap. I have given a good deal of care and study to this subject, and I think I may say, without boasting, that during the period of my public life I have done many things for its benefit. I will point out one. I pressed the measure to free the canal, against all the combined influences, political and commercial. I have brought forward and seen pass a measure which will allow every railroad in the United States to come into this city, although it was bitterly opposed by the only railroad which had that privilege; I refer to the New York Tunnel. That will be a success not only as a tunnel, but a success which will realize great results in the commerce of this city, and instead of the Erie Railway building its great elevators for the trans-shipment of grain, they will be built here upon our island, giving us the wealth, prosperity and importance that attaches thereto. The future glory and prosperity of our city are not to be lost sight of by any of us. Its past is a record of splendor and patriotic devotion at all times to the State and to the nation. It has given at all times its soldiers and sailors for the defense of the country, and during the late war, without regard to public feeling or affiliation, all, whether, like me, born of German parents, Englishmen, Irishmen or Scotchmen, came forward as promptly as the native-born citizens of New York. It behoves them all, then, I say, to look forward to the prosperity and the growth of the city, to the one thing alone which has made the city great and will continue

to sustain its prosperity, which is its commerce. New York is a commercial city, and when it ceases to be a commercial city it is nothing. A metropolis by the sea, it is one of the great cities and financial centres of the world to-day, and will be, with proper encouragement, the great financial centre of this New World.

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Dr. Hayes having died about the time when this lecture was written out from the reporter's notes, it was never revised by him, though some palpable errors have been corrected by a friend.

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BIOGRAPHICAL SKETCH  
OF  
D O C T O R I S A A C I . H A Y E S ,  
BY  
GENERAL GEORGE W. CULLUM, U. S. ARMY,  
VICE-PRESIDENT OF THE SOCIETY.

One short month had scarcely elapsed after the delivery of the foregoing brilliant and instructive lecture, when the sad tidings came to us that the distinguished Arctic explorer—Dr. Isaac Israel Hayes—had died of heart disease on Saturday morning, December 17, 1881. He was first attacked on Friday, but towards night had so far recovered that his friends had no fears for his life. A fatal relapse soon following, a physician was called in, who, upon applying his ear to the patient's heart, declared there was no hope of recovery.

Doctor Hayes was born, March 5, 1832, in Chester County, Penn. His parents, who were Quakers, after giving him a good elementary education, sent him to the University of Pennsylvania, from which he was graduated with the degree of M.D. in May, 1853, at the age of twenty-one. From boyhood he had evinced a passion for adventure, and even, five months before his graduation, had applied to Dr. Kane for permission to accompany him to the Polar Seas. On May 29, 1853, he secured the coveted appointment of surgeon in the second Grinnell expedition, with which he sailed the next day in the brig *Advance*, the former companion of the *Rescue* in the "Franklin Search" voyage under Lieutenant De Haven, United States Navy. Kane, after battling with the ice and reaching a more northerly latitude than any of his predecessors had yet attained by water, took up his winter quarters, September 9, 1853, in Rensselaer Harbor. Nothing of special importance, except short excursions on the ice, with the thermometer ranging from 60° to to 75° below zero, took place until May 18, 1854, when Dr. Hayes and William Godfrey, with a dog-sledge, proceeded across the ice on Smith Sound to the west shore, as far as latitude 79° 45' and

longitude  $69^{\circ} 12'$  west. After identifying the position of Cape Frazer, they returned to the *Advance*, of whose entire crew of seventeen only five then remained sound and well. The next tour of duty devolved upon Morton, who, on June 24th, climbing to a height of 480 feet at Cape Constitution, saw an "Open Polar Sea" (since shown to be Hall's basin at the end of Robeson's channel), and there planted the little American flag which Commodore Wilkes carried to the Antarctic regions, and, after accompanying De Haven, Kane, Hayes and Hall's northern expeditions, is now a sacred relic among the Arctic treasures of our Geographical Society.

On the 28th of August, 1854, the *Advance* being still imprisoned in the ice, and provisions running short, Dr. Hayes and eight men, by permission of the Commander, left the brig with the design of reaching the nearest Greenland settlement to procure relief for those left behind. After proceeding to a little south of Booth's bay, the new-formed ice barred, September 28th, their further progress. Here they built a hut and remained in this dreary region for two months among the Esquimaux. The expedition proving a failure, and their sufferings becoming almost unendurable, they decided to return to the brig, which they reached in the middle of the Arctic night, December 12, 1854, covered with rime and snow, their energies broken, faint with hunger (having long lived on frozen seal and walrus meat) and almost perishing with cold, the thermometer being  $56^{\circ}$  below zero. The graphic record of the almost incredible privations and hardships of this perilous journey is given by Dr. Hayes in his volume entitled, "An Arctic Boat Journey," published in 1860. The *Advance*, being finally abandoned, May 17, 1855, her crew, after a successful pilgrimage of eighty-one days, reached Upernivik, August 6th, and a month later embarked in a Danish vessel for their homes.

In this second Grinnell expedition Dr. Hayes had not only distinguished himself by his professional skill and efficiency, but had exhibited that intrepidity and enthusiasm which eminently entitled him to receive the mantle of Dr. Kane, who died in 1857, as his successor in Arctic exploration.

On Dr. Hayes' return in 1855 he immediately began to stir up public curiosity and scientific interest in Polar research. He firmly

believed in the existence of an Open Polar Sea (his faith in which was not shaken to the day of his death), and he resolved to organize a new expedition for its exploration. In 1857 and again in 1858 he presented his views to the American Geographical Society in able papers, entitled "Polar Discoveries of Dr. Kane, and a Plan for Further Research," which he followed up by lectures at the Smithsonian Institution at Washington and throughout the Northern States. These efforts stimulated scientific societies, both in Europe and America, to contribute funds, which were largely increased by private subscriptions, the most munificent of which was made by that merchant prince—Henry Grinnell—once President of this society.

Dr. Hayes set sail from Boston July 6th, 1860, in the schooner *United States*, with ample supplies and a crew of fourteen officers and men. Upon arriving at the northern Greenland settlements, his equipment was increased by two Danish sailors, four Esquimaux hunters (including Hans Christian, his old shipmate in the *Advance*), and a team of excellent dogs. After considerable detention, the schooner entered Smith Sound August 27th, where she was severely buffeted by the storms, but finally found shelter in a small bay, subsequently named Port Foulke. Frustrated in his attempts to force a passage across the Sound to Grinnell Land, and the new ice forming around his schooner, Dr. Hayes decided to winter in this little snug harbor he had discovered. The vessel was now unloaded and converted into a very comfortable dwelling, while the hunters furnished an ample supply of reindeer, rabbit and fox-meat. During the long Arctic winter the Doctor deeply studied the nature and formation of the glaciers and icebergs which surrounded him, thereby adding much to the scientific investigations already made by De Saussure, Rendu, Tyndall, Agassiz, Forbes and others, showing that: "The iceberg is the *discharge* of the Arctic river, the Arctic river is the glacier and the glacier is the accumulation of the frozen vapors of the air." The crew at the same time had plenty of agreeable occupation in pleasant books and amusements, the publication of a clever weekly newspaper, hunting game, which abounded, training dogs for spring excursions, watching bear fights on the ice, and often gazing upon the gorgeous and sublime spectacle of the sky during the Arctic night.

The most splendid and impressive of these auroral displays occurred on the night of January 6th, 1861, the brilliant description of which we give in the Doctor's own expressive language. He says :

"The darkness was so profound as to be oppressive. Suddenly, from the rear of the black cloud which obscured the horizon, flashed a bright ray; but before one could say 'Behold!' the 'jaws of darkness did devour it up.' Presently an arch of many colors fixed itself across the sky, like a bridge for the armies of the Unseen, and the aurora gradually developed. The space within the arch was filled by the black cloud, but its borders brightened steadily, though the rays discharged from it were exceedingly capricious—now glaring like a vast conflagration, now beaming like the glow of a summer morn. More and more intense grew the light, until from irregular bursts it matured into an almost uniform sheet of radiance. Towards the end of the display its character changed. The heavenly dome was all aflame. Lurid fires flung their awful potents across it, before which the stars grew pale and seemed to recede farther and farther from the earth. The gentle Andromeda seemed to fly from the scene of warfare; even Perseus, with his brilliant sword and Medusa shield, drew back apace; the Polar Star vanished from the night; and the Great Bear, trusty sentinel of the North, for once abandoned his watch, and followed the fugitive. The color of the light was chiefly red, but every hue had its turn, and sometimes two or three were mingled; blue and yellow steamers shot across the terrible glare, or starting side by side from the wide expanse of the radiant arch, melted into each other and flung a strange shade of emerald over the illuminated landscape. Again this green subdues and overcomes the red; then azure and orange blend in rapid flight; subtle rays of violet pierce through a 'broad flush of yellow,' and the combined streams issue in innumerable tongues of white flame, which mount towards the zenith. Surely it is impossible to gaze upon a scene so various, so unearthly, so wonderful, without a silent recognition of the wisdom and power the great Final Cause! The emotional side of our nature comes in to strengthen and exalt our reason; our faith quickens; our convictions acquire a new life; our hearts, however cold before, are compelled to pour their passionate raptures into the grateful yet exultant strain, *TE DEUM LAUDAMUS*,—'We praise Thee, O God: we acknowledge Thee to be the Lord!'

The weird forms of countless icebergs, singly and in clusters, loomed above the sea, and around their summits the strange gleam shone as the fires of Vesuvius over the doomed temples of Campania. Upon the mountain tops, along the white surface of the frozen waters, upon the lofty cliffs, the light glowed and grew dim, and glowed again, as if the air were filled with charnel meteors, pulsating with wild inconstancy over some vast illimitable city of the dead. Silent was the scene, yet it practiced a strange deception upon the senses, for the swift flashes seemed followed by unearthly noises, which fell upon the ear like

"The tread  
Of phantoms dread,  
With banner, and spear and flame!"

The Arctic night, which in this latitude lasts more than a third of a year, and to most voyagers, so depressing, was to Dr. Hayes truly exhilarating, if we may judge by his sublime description, which we give at length:

"There is in the Arctic night much that is attractive to the lover of Nature.

"There is in the flashing aurora, in the play of the moonlight upon the hills and icebergs, in the wonderful clearness of the starlight, in the broad expanse of the ice fields, in the lofty grandeur of the mountains and the glaciers, in the naked fierceness of the storms, much that is both sublime and beautiful. But they speak a language of their own—a language rough, rugged and severe.

"Nature is here exposed on a gigantic scale. Out of the glassy sea the cliffs rear their dark fronts and frown grimly over the desolate waste of ice-clad waters. The mountain peaks, glittering in the clear, cold atmosphere, pierce the very heavens, their heads hoary with unnumbered ages. The glaciers pour their crystal torrents into the sea in floods of immeasurable magnitude. The very air, disdaining the gentle softness of other climes, bodies forth a loftier majesty, and seems to fill the universe with a boundless transparency; and the stars pierce it sharply, and the moon fills it with a cold fulgence. There is neither warmth nor coloring underneath this ethereal robe of night. No broad window opens in the East, no gold and crimson curtain falls in the West upon a world clothed in blue and green and purple, melting into one harmonious whole, a

tinted cloak of graceful loveliness. Under the shadow of the eternal night, nature needs no drapery and requires no adornment. The glassy sea, the tall cliff, the lofty mountain, the majestic glacier, do not blend one with the other. Each stands forth alone, clothed only with Solitude. Sable priestess of the Arctic winter, she has wrapped the world in a winding-sheet, and thrown her web and woof over the very face of Nature.

"And I have gone out often into the Arctic night and viewed Nature under varied aspects. I have rejoiced with her in her strength, and communed with her in repose. I have seen the wild burst of her anger, have watched her sportive play, and have beheld her robed in silence. I have walked abroad in the darkness when the winds were roaring through the hills and crashing over the plain. I have strolled along the beach when the only sound that broke the stillness was the dull creaking of the ice-tables, as they rose and fell lazily with the tide. I have wandered far out upon the frozen sea and listened to the voice of the icebergs bewailing their imprisonment; along the glacier, where forms and falls the avalanche; upon the hill top, where the drifting snow, coursing over the rocks, sang its plaintive song; and again I have wandered away to some distant valley where all these sounds were hushed, and the air was still and solemn as the tomb.

"And it is here that the Arctic night is most impressive, where its true spirit is revealed, where its wonders are unloosed to sport and play with the mind's vague imaginings. The heavens above and the earth beneath reveal only an endless and fathomless quiet. There is nowhere around me evidences of life or motion. I stand alone in the midst of the mighty hills. Their tall crests climb upward, and are lost in the gray vault of the skies. The dark cliffs, standing against their slopes of white, are the steps of a vast amphitheatre. The mind, finding no rest on their bald summits, wanders into space. The moon, weary with long vigil, sinks to her repose. The Pleiades no longer breathe their sweet influences. Cassiopea and Andromeda and Orion, and all the infinite host of unnumbered constellations, fail to infuse one spark of joy into this dead atmosphere. They have lost all their tenderness, and are cold and pulseless. The eye leaves them and returns to earth, and the trembling ear awaits something that will break the oppressive stillness. But

no footfall of living thing reaches it; no wild beast howls through the solitude. There is no cry of bird to enliven the scene; no tree, among whose branches the winds can sigh and moan. The pulsations of my own heart are alone heard in the great void; and as the blood courses through the sensitive organization of the ear, I am oppressed as with discordant sounds. Silence has ceased to be negative. It has become endowed with positive attributes. I seem to hear and see and feel it. It stands forth as a frightful spectre, filling the mind with the overpowering consciousness of universal death—proclaiming the end of all things, and heralding the everlasting future. Its presence is unendurable. I spring from the rock upon which I have been seated, I plant my feet heavily in the snow to banish its awful presence—and the sound rolls through the night and drives away the phantom.

“I have seen no expression on the face of Nature so filled with terror as **THE SILENCE OF THE ARCTIC NIGHT.**”

Upon the termination, February 18th, of this prolonged period of darkness, Dr. Hayes applied himself to the welcome task of preparing for new discoveries. On the 4th of April, with a metallic lifeboat, two dog-sledges and twelve men, he started across the ice for Grinnell Land, but the passage of the Sound, which was covered with high hummocks, pressed up in the wildest confusion, was found to be impassable for the whole party and their sledges, therefore he sent all back to the schooner except three men and fourteen dogs, with which he marched and scrambled over the rugged ice till May 11th, when he reached Cape Hawks, and thence, following the western shore of the Sound, arrived at Cape Frazer on Kennedy channel. On May 16th, with a single companion, travelling with a dog-sledge, he reached the most northern land ever before visited by man, and from a rugged cliff, 800 feet high, surveyed the glorious prospect, no land to the north being visible. He marked the limit of his discoveries by flags and a cairn, in which he enclosed a memorandum, dated May 19, 1861, stating :

“We arrived here after a toilsome march of forty-six days from my winter harbor, near Cape Alexander, at the mouth of Smith Sound. My observations place us in lat.  $81^{\circ} 35'$ , long.  $70^{\circ} 30'$  W. Our further progress was stopped by rotten ice and cracks. Kennedy channel appears to expand into the Polar basin; and, satisfied

that it is navigable at least during the months of July, August and September, I go hence to my winter harbor to make another trial to get through Smith Sound with my vessel, after the ice breaks up this summer."

"This record," says Dr. Hayes, "being carefully secured in a small glass vial, which I brought for the purpose, it was deposited beneath the cairn; and then our faces were turned homewards. But I quit the place with reluctance. It possessed a fascination for me, as it was with no ordinary sensations that I contemplated my situation with one solitary companion in that hitherto untrdden desert; while my nearness to the earth's axis, the consciousness of standing upon land far beyond limits of previous observation, the reflections which crossed my mind respecting the vast ocean which lay spread out before me, the thought that these ice-girdled waters might lash the shores of distant islands where dwell human beings of an unknown race, were circumstances calculated to invest the very air with mystery, to deepen the curiosity, and to strengthen the resolution to persevere in my determination to sail upon this sea and to explore its furthest limits; and as I recalled the struggles which had been made to reach this sea,—through the ice and across the ice,—by generations of brave men, it seemed as if the spirits of these Old Worthies came to encourage me, as their experience had already guided me; and I felt that I had within my grasp 'the great and notable thing' which had inspired the zeal of sturdy Frobisher, and that I had achieved the hope of matchless Parry."

The existence of such an open sea, represented on maps as early as 1608, he argues at length, and in conclusion says:

"With the warm flood of the Gulf Stream pouring northward, and keeping the waters of the Polar sea at a temperature above the freezing point, while the winds, blowing as constantly under the Arctic, as under the Tropic sky, and the ceaseless currents of the sea and the tide-flow of the surface, keep the waters ever in movement, it is not possible, as I have before observed, than even any considerable portion of this extensive sea can be frozen over. At no point within the Arctic Circle has there been found an ice-belt extending, either in winter or summer,

more than from fifty to a hundred miles from land. And even in the narrow channels separating the islands of the Parry Archipelago in Baffin bay, in the North Water, and the mouth of Smith Sound,—everywhere, indeed, within the broad area of the Frigid Zone, the waters will not freeze except when sheltered by the land, or when an ice-pack, accumulated by a long continuance of winds from one quarter, affords the same protection. That the sea does not close except when at rest I had abundant reason to know during the late winter; for at all times, as this narrative frequently records, even when the temperature of the air was below the freeing point of mercury, I could hear from the deck of the schooner the roar of the beating waves."

Hayes now commenced his return journey from Cape Leiber,\* and reached his schooner June 3d, after a journey of two months, during which he had travelled 1,300 miles, amidst furious storms and bitter cold, through treacherous snow-drifts and rugged ice-floes, over cragged hummocks and rocky headlands, and against every desperate and appalling obstacle. Of his little forlorn hope, only himself and one companion, with a single dog-sledge, reached the northernmost point, men and animals having fallen by the way-side faint with hunger, exhausted with toil, or stilled in death. But during all these trials the Doctor never desponded, and, cheerful to the last, his only remark, on getting safely back to the schooner, was: "I am somewhat battered and weather-beaten, but a day or so of rest and civilized comfort, the luxury of a wash and a bed, and of a table covered with clean crockery filled with the best of things that my old Swedish cook can turn out, are wonderfully rejuvenating, potent as the touch of Hebe to the war-worn Iolas."

At Port Foulke, Hayes discovered that his vessel's fore-timbers had been seriously injured, that the schooner could not stand the strain and pressure of the heavy ice, and that therefore nothing was to be done but escape from his prison as soon as the sum-

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\* Lieutenant Greeley, an officer of our Army, now in the Arctic Regions, visited Cape Leiber this summer, climbed the cliff, 2,500 feet high, and had a magnificent view from it of Polaris Promontory, Peterman's Fiord, Bessel's Bay and Lady Franklin Sound. The cavern, entered here by Dr. Hayes, could not be found.

mer's thaw would permit. The swell of the open water having finally reached Port Foulke, the *United States*, July 14th, glided from her comfortable winter quarters, and, after a very successful run, was in Boston harbor, October 23, 1861.

The results of the expedition claimed by Dr. Hayes were:

"1. I have brought my party through without sickness, and have thus shown that the Arctic winter, of itself, breeds neither scurvy or discontent.

"2. I have shown that men may subsist themselves in Smith Sound independent of support from home.

"3. That a self-sustaining colony may be established at Port Foulke, and be made the basis of an intended exploration.

"4. That the exploration of this entire region is practicable from Port Foulke,—having from that starting point pushed my discoveries much beyond those of my predecessors, without any second party in the field to coöperate with me, and under the most adverse circumstances.

"5. That with a reasonable degree of certainty, it is shown that, with a stong vessel, Smith Sound may be navigated and the open sea reached beyond it.

"6. I have shown that the open sea exists."

The full narrative of this Arctic expedition is admirably related by Dr. Hayes in his book published in 1867, entitled "The Open Polar Sea."

At Greenland and Nova Scotia, where he had touched on his return, Dr. Hayes received the startling intelligence that his native land was engaged in civil war and the Union threatened with dissolution. Instantly he abandoned his purpose of undertaking a new expedition, and "closed as well the cruise as the project, by writing a letter to the President asking for immediate employment in the public service and offering his schooner to the Government for a gunboat." His vessel proving to be too small for efficient war purposes, the Doctor at once joined the medical staff of the army. The celebrated "Satterly Hospital," at West Philadelphia, with ample accommodations for 4,000 patients, was constructed according to his plans, and during the war, through most of which he was there in command, 30,000 patients received medical treatment in this hospital. For his zealous services he received the brevet of Lieutenant-Colonel.

When the Rebellion had terminated, Dr. Hayes, with unabated ardor for Polar exploration, was again desirous to try fresh fields and dangers new. He firmly believed that after passing an ice-belt along the land about latitude  $83^{\circ}$  the Pole could readily be reached through an open, not a frozen, sea. Hayes always ridiculed Sir George Nares' idea of a "palaeocrystic sea," he contending that water, being a restless object, such an extensive area of it could not possibly be frozen over, "deep sea water throughout the world being rarely below  $40^{\circ}$  Fahrenheit." With this firm belief Hayes hoped that the northern coasts of Greenland and Grinnell Land would be fully explored, the ice-belt be crossed, and the American flag be planted at the Pole before another country should step in to reap the glory. Therefore it was that he said in his lecture on "The Progress of Arctic Discovery," delivered November 12th, 1868, before the American Geographical Society: "I am no less earnest than formerly for the opportunity to conduct the expedition that would accomplish these results myself, and once more try conclusions with my old foe the Smith Sound ice."

It was in this learned lecture that he traced the progress from ancient to modern geography, when exploration was so revived among the Italians, Spaniards and Portuguese, sending De Gama around the Cape of Good Hope, Andreada to China and Columbus to a new world. The whole ocean was swarming with adventurers when the Pope issued his famous bull generously donating the Eastern Hemisphere to the Portuguese and the Western to the Spaniards. Other nations thinking, as the King of France said, "it something strange the Lord should have forgotten them all in his will," disregarded the bull of partition, boldly pushed into every unknown sea, and finally took up the pursuit of a northern route to the Indies, which has since led to so many Polar explorations.

Failing to obtain the means for organizing another Arctic expedition, Hayes, in 1869, joined the artist Bradford in the steam-yacht *Panther* on an excursion to Greenland; and while his friend was obtaining materials for his easel, he was laboriously occupied in geographical and scientific pursuits. Following the western coast of Greenland from Cape Farewell to the ice-pack of Melville bay, Hayes visited most of the Norsemen settlements made in the tenth to the fifteenth centuries, from Ericsfjord, upon which Eric

the Red had planted his first colony in 986, of which the ruins were still visible, to Upernavik, the last outpost of civilization. These Friseland settlements contain most of the inhabitants of Greenland, whose total population is less than 10,000, though its area equals about one-third of that of all Europe. Greenland is truly the Land of Desolation, the whole interior being a howling wilderness of rock and mountain covered with perpetual snow and ice, from which are formed its vast and terrible glaciers. One of these near the head of Smith Sound, called by Kane the "Great Humboldt Glacier," is sixty miles wide, its lower end, forming an ice-cliff, in places five hundred feet above the sea and extends below into it to a depth of nearly half a mile. The flow of such a glacier is like a mighty frozen Niagara, with irresistible force leaping precipices, climbing acclivities, sweeping down valleys, crushing every obstacle in its path, carrying off huge boulders, roaring sometimes with a voice of thunder, slowly making its majestic march and at last plunging into the ocean. Being lighter than sea-water, the submerged end becomes forcibly buoyed up and broken off into huge masses forming floating icebergs, one of which Dr. Hayes measured and describes as three and a half miles in circumference, more than a quarter of a mile deep and of cubical contents beyond the carrying capacity of all the ships in the world. To the study of the glaciers and icebergs of Greenland, the birthplace of nearly all in the northern hemisphere, Dr. Hayes gave much time and greatly added to what was previously known of their formation and movements. His poetic description of an iceberg as follows :

"Solemn, stately and erect, in tempest and in calm, it rides the deep. The restless waves resound through its broken archways and thunder against its adamantean walls. Clouds, impenetrable as those which shielded the graceful form of Arethusa, clothe it in the morning; under the bright blaze of the noonday sun it is armored in glittering silver; it robes itself in the gorgeous colors of evening; and in the silent night the heavenly orbs are mirrored in its glassy surface. Drifting snows whirl over it in the winter, and the sea-gulls swarm round it in the summer. The last rays of departing day linger upon its lofty spires; and when the long darkness is past it catches the first gleam of the returning light, and its gilded dome heralds the coming morn. The Elements combine to render tribute

to its matchless beauty. Its loud voice is wafted to the shore, and the earth rolls it from crag to crag among the echoing hills. The sun steals through the veil of radiant fountains which flutter over it in the summer winds, and the rainbow on its pallid cheek betrays the warm kiss. The air crowns it with wreaths of soft vapor, and the waters around it take the hues of the emerald and the sapphire. In fulfillment of its destiny it moves steadily onward in its blue pathway, through the varying seasons and under the changeful skies. Slowly as, in ages long gone by, it arose from the broad waters, so does it sink back into them. It is indeed a noble symbol of the Law,—a monument of Time's slow changes, more ancient than the Egyptian Pyramids or the obelisk of Heliopolis. Its crystals were dew drops and snowflakes long before the human race was born in Eden."

The year after his return from Greenland the Council of the American Geographical Society recommended Dr. Hayes for the command of the projected new Arctic expedition which the President of the United States subsequently bestowed upon Captain Hall, who, after a flattering reception by this society, set sail July 3, 1871, in the *Polaris*, himself never to return. He rests at the foot of the wild crags of Polaris Promontory, surrounded by the snow-covered peaks and uplands, the solitudes of which he was the first to throw open to the gaze of civilized man.

Dr. Hayes, in 1874, went to Iceland to be present on the thousandth anniversary of the foundation of the Norse Republic. After an enthusiastic reception of Christian IX., the King of Denmark, in the harbor of Reykjavik it was celebrated with imposing ceremonies, in the grand and frightful valley of Thingvalla, the holy ground of Iceland as described in the Sagas, where Christianity was established in the year 1000. This

Land of volcano and of fire,  
Of icy mountains, deserts hoar,  
Of roaring floods, and earthquakes dire,  
And legendary lore,

to an enthusiastic American like Dr. Hayes must have had peculiar attractions, not only because of the physical contests of nature there so manifested ; but it was from these jagged, black, surf-beaten, lava-rock shores that the daring Norse Vikings boldly ventured into un-

known seas to discover Greenland, and thence sailed to these more genial climes, nearly five hundred years before Columbus planted the banner of Spain upon American soil.

Of this Iceland Millennial he gave an account to this Society at its Norse meeting, held November 23, 1874. Besides this report and many lectures delivered before this society, Dr. Hayes made appropriate addresses on various occasions, particularly at the memorial meeting on the death of Dr. Livingstone, and on the receptions of the *Polaris*' crew, Dom Pedro of Brazil, Earl of Dufferin, and Lieutenant Schwatka of our army. His last lecture, which precedes this biographical sketch, will doubtless be read with great interest and profit, not only by the members of this Society but by many of the residents of this commercial city, the causes of whose prosperity he has so accurately and historically traced.

For nearly a quarter of a century Dr. Hayes was a valued member of this Society; since 1876 one of its council; and stood ever ready by tongue and pen to render efficient assistance to our Association. Abroad, his worth and services were no less recognized than at home. The Royal Geographical Society of London, the Paris Geographical Society, and the British Government each gave him a gold medal for his Explorations in the Polar Seas; the Victoria Silver Medal was awarded him "for Arctic Discoveries;" and the Emperor Maximilian, of Mexico, decorated him with the Cross of the Legion of Honor.

Dr. Hayes, besides being a distinguished explorer, was a brilliant author, having published several very interesting and valuable volumes, to some of which we have already alluded, recording his thrilling adventures, geographical discoveries and scientific observations. These works are entitled: "An Arctic Boat Journey;" "The Open Polar Sea;" "Cast Away in the Cold;" and "The Land of Desolation." Besides these books, he has written some of a lighter character, many magazine articles, popular discourses and learned lectures, not only on geographical and scientific subjects but on commercial, hydrographic, political and literary themes.

During the closing years of his life, Dr. Hayes having no longer a vent for his active mind and restless energy in seeking yet undiscovered lands and seas, entered the treacherous arena of politics. Being a staunch and zealous Republican, a popular and magnetic

man, and withal a fluent debater and learned in legislation, he was elected to the House of Representatives of the State of New York from the Seventh Assembly District of this city, taking his seat in Albany in 1876, and every year thereafter till his death. Upon his renomination for the present year he declined, doubtless feeling that his course in the Legislature, particularly during the last session had not entirely satisfied many of his constituents. Though he had thus made enemies, he had troops of warm, admiring friends, who felt that he was a courageous leader and possessed the essential qualities for success. Without a vocation, he again took to lecturing, and, less than a fortnight before his death, delivered one of his most brilliant and instructive addresses on "Polar Exploration" to a crowded assembly in Chickering Hall. He always talked well, wrote better, and lectured best, for he was master of his subject, quick-witted, nervous in style, full of facts, picturesque in description, eloquent in diction, and, with a fiery energy in manner and speech, carried captive his entire auditory. In his death, the geographical world has lost one of its brightest lights, physical science one of its faithful laborers, and this Society a member zealously devoted to its highest advancement in fulfilling the objects of its organization.

## COREA, THE HERMIT NATION.

BY REV. WM. ELLIOT GRIFFIS.

I have never entered "the Corea," as it used to be called, in bodily presence, though often there in thought and study; but then, perhaps, no other living foreigners except the Japanese and surviving French missionaries have lived in the inhospitable peninsula. Navigators, traders, shipwrecked waifs, and trespassers with evil intent, have, indeed, set foot on Corean shores, but the only dwellers inside the country have been the Japanese, occasionally a Chinaman, a few captive Dutchmen in the seventeenth century, and the brave soldiers of the Cross and Keys from France, who, in disguise, have propagated their faith and good works. However, as I have carefully and critically digested the writings of European visitors to the coasts, the voluminous narratives and descriptions of the Japanese, and from many quarters obtained light on this country, which still sits in hermit seclusion, I hope to give you a luminous account of a country soon to be better known to the world.

In the first place, let us glance at this map, seven feet square, on which I have outlined the principal features of the geography of the little kingdom. My map is based on the splendidly accurate one made by the Japanese War Department in 1876, when the Mikado's soldiers expected to cross swords with the peninsulars. Fortunately, instead of war, a treaty of peace and commerce, which opened two ports for trade, was consummated. This fine specimen of Japanese cartography is based on actual examination of many points, the surveys of foreign men-of-war, native maps, and the charts which are rapidly issuing from the Japanese Hydrographic Department. It was drawn on copper-plate, and is marked with the degrees of latitude and longitude. With unusual modesty, instead of having their initial meridian bisect Tokio, which they ordinarily do, using their own national capital as the centre of measurement, the makers of the map have adopted the longitude east from Greenwich. At this map let us glance, before touching upon the historical and social side of Corean life.

The peninsula with its outlying islands is nearly equal to Minnesota or Great Britain, or twice the size of Ohio, having an area computed to be between 80,000 and 90,000 square miles, with a coast line proper of 1,740 miles. In general shape and position it reminds us of Florida, hanging down between Japan and China, separating the Yellow and Japan seas, and stretching between the 33d and 43d degrees of north latitude. In configuration it resembles more a headless butterfly than the "playing card" of old geographers —though for ages it has been alternately the "trump" and the losing card of either Japan and China. Situated between the ever rival, and often hostile nations of Japan and China, its political situation is most unfortunate. Between these upper and nether millstones, Corea's political history resembles that of meal and powder. She lies, too, on the track of the northern invaders who have so often swarmed like bees out of their hives in the Amur Valley, pouring southward to the conquest of China. This fact will explain why Corea has been fitly denominated "the hermit nation." Anciently and in mediæval centuries the Coreans held free intercourse with the Chinese, Japanese, their northern neighbors, and even with the Arabs. But since the last desolating invasion of her soil by the Japanese, from 1592 to 1597, during which time, her Chinese allies and invaders alike ate up her substance, Corea has locked all her sea, mountain and river doors against every foreigner. Along her coast line she keeps a cordon of jealous sentinels whose orders are peremptory to warn off every strange comer, and to communicate to the capitol the bad news of his arrival and the welcome intelligence of his departure. For three centuries the telegraphic fires have blazed on the headlands from seaport to Seoul. Dense white columns of smoke by day, made by heaping wet chopped rice straw on a hot fire, and blazing cressets at night, their lines converging on a mountain south of the capital, formed a regularly paid government signal service. Along the rivers of the north, especially at the fords and in the mountain passes, "custom-houses," better called picket stations, were numerous and maintained at great expense. Not satisfied with these precautions, portions of the sea-coast and a line of country ten miles wide along the Tumen river were desolated, while on the Manchurian frontier a strip of neutral territory twenty leagues wide stretched, in solitudes abandoned to the tiger and the

outlaw, from near the Pacific ocean diagonally to the Yellow sea. In some places wooden palisades assisted to keep the supposed "scientific frontier" inviolate. With only one nation, China, has Corea kept up friendly relations—those of tribute and ceremony only, though to Japan, until lately, a reluctant annual acknowledgment of nominal vassalage was kept up.

The disintegrating force of events has already begun to break down the policy of isolation. Already the wooden palisades may be safely erased from our maps. The neutrality of the "dead-line" on the Manchurian frontier is no longer respected by the Chinese Government, by whose orders it has been largely surveyed, staked out and given to cultivation, while enterprising Chinese gunboats have discovered the navigability of the Yalu river. China, to save her exchequer from possible "war indemnities," claimed by Japan, France and the United States, has expressly declared in writing that the relations of Corea with the Middle Kingdom are those of ceremony only. Though Russia, France, the United States, England, Germany and Italy have thus far been baffled in repeated attempts to open the forbidden land to trade, the Japanese have a treaty, a legation in Seoul, the ports of Fusan and Gensan, on the eastern or Japanward coast, open to trade and residence, with the prospect of soon occupying Ninsen, near the capital, on the western or Chinaward side. Instead of hailing Chinese trespassers on the neutral strip or from the fishing fleet, to prison and death, the smuggling is so profitable to the merchants and so palm-tickling to the officials, that a native or Chinaman executed for trading—being poor rather than guilty—is rare indeed, though formerly the sovereign of the country "made very free with the heads of his subjects" for this very crime, as it was so called.

A striking difference between the western and eastern coasts of Corea is manifest upon inspection of the map. The former, fronting Japan, is but a long mountain ridge, presenting its high wall to the sea, and offering few bays or harbors, and almost no islands. The eastern coast, with central Corea, is but the slope of these mountains; and river mouths, sandbanks, ports and bays are numerous, together with a vast number of islands which constitute the Corean archipelago. The rivers flowing down from the mountains far up in the hill country, have unusually violent currents, which, in nu-

merous instances, have formed dangerous sandbanks along the coast. In general, it may be said that the chief rivers have carved out the political divisions, since the eight *do* or provinces are so many river-basins, walled in by mountain ranges. These ranges are the ribs branching from the backbone of the peninsula, which extends through its whole length from the Tumen river to the Yellow sea, the larger islands to the west being but emerging fragments. This Corean wall is but one brim of the deep sea-bowl of which Japan forms the corresponding segment and edge. While the water of the Sea of Japan is very deep, that of the Yellow sea and Gulf of Pechili are very shallow, and probably of recently geological growth, formed by submergence of the land.

The two northern provinces, Pieng-an and Ham-kieng, have a very cold climate and are thinly inhabited. In these the tigers are very numerous. According to the Chinese jest "the Coreans hunt the tiger six months of the year, and the tigers hunt the Coreans the other half." Furs are a staple commodity and an almost exhaustless product. Millet, fish and game-flesh form the chief food of the northern people. Gensan is in the region bordered by what is known to Europeans as Broughton's bay, and beyond the Tumen river are the Russian possessions, in which are now living about six thousand refugee Coreans who have fled religious persecution or governmental exactions. Of these you have heard from a n eye-witness and an honored traveler of your society, Mr. Walton Grinnell. I shall exhibit several stereopticon views of their villages made from photographs taken on the spot by a member of the United States Transit of Venus Expedition of 1875. In Pieng-an province we find the loophole and sally-port of the Corean "enchanted castle," in the town of Ai-chiu near the mouth of the Yalu river. Through this place the annual embassy sets out for Peking and enters again through this gate; also the French missionaries, disguised as wood-cutters, have penetrated and have built up a church of twenty thousand believers. In the south, on Pieng-an (or Ping-yang) river, is situated the capital city of the same name, famous for its many sieges by Chinese, Japanese, Tatar and Corean armies. Here also took place the slaughter of the crew of the *General Sherman*, in 1866, which led to the United States Naval Expedition of 1871.

Whang-hai province borders on the sea of the same name, and its coasts are rich in pearls and herrings. To catch the latter and to smuggle merchandise, hundreds of Chinese junks come yearly. The mountainous province of Kang-wen, on the east coast, is full of hunting-grounds and beautiful scenery, which the Coreans enjoy immensely. The province of Kieng-kei contains the *seoul* or capital, Han-yang, and the chief commercial city, Sunto or Kai-seng. At favorable strategic points four fortified cities are set for the defense of Seoul. The Han river, rushing on a terrific down-grade, drains nearly the whole breadth of the peninsula, which accounts for its violent current. It is often frozen over at Seoul four months in the year. A number of photographs of the capital city taken by the Japanese embassy will be shown on the screen for your examination. Kang-hoa island, at the mouth of the river, is renowned in native history, and as the scene of the operations of the French Naval Expedition of 1866, the Americans in 1871 and Japanese in 1875 and 1876—only the latter being productive of noticeably good results.

We come now to speak hastily of the three southern provinces, the warmest and richest in the peninsula. With Chieng-cheng province the labors of Basil Hall and Gutzlaff, and the "China" affair are associated. In these three, geographical, missionary and filibustering zeal have been exhibited. It is warm and fertile, the granary of the kingdom and the cradle of Corean Christianity. In Chien-la do the Dutch captives, whose narrative has been written by Howel, lived from 1653 to 1668. Though his story was doubted in Europe, chiefly because the names of places in his book did not correspond with those on the map made by the Peking Jesuits, yet I have been able to identify his routes of travel, and nearly everyone of the towns named by him, and from many sources, have proved the verity of his observations.

Kieng-sang is the province nearest Japan, containing the port of Fusun, the City of Tong-nai, and the site of the castle of Uru-san, so famous for the siege, in 1596-7, of a Japanese garrison, by eighty thousand Chinese and Coreans. These southern provinces are rich in horses and cattle, and now that the Japanese are likely to become beef-eaters, and have already begun to wear boots and shoes, their problem of meat and leather supplies is solved. Already the

Japanese have exported thousands of hides. Raw silk of peculiar and excellent fibre is also grown. Rice, which for the Japanese epicure excels the Chinese product, is plentifully produced. The abundance of gold dust, which for centuries has found its way to Japan and China, and is now a regular export to Japan, proves Corea to belong to the gold-bearing nations. A recent scientific visitor, an American, to Gensan, has predicted that Corea is likely in the future to disturb, by her abundance of this precious metal, the gold markets of the world. Thus far the imports from Japan and China alike have been in great proportion, British and American goods ; and the prospect of a direct market for American commodities is, to say the least, encouraging. That it was no fault of Commodore Shufeldt of the *Ticonderoga* in failing to secure a treaty of commerce in June, 1880, is, however, certain. The Coreans, judging from their experience of our countrymen, are not yet anxious to open their doors. The Japanese succeeded in 1876 only by imitating, even to trivial details, the methods of Commodore M. C. Perry with themselves, in 1854.

A glance at Corean history shows that from 1122 B. C. to about the Christian era the seat of their civilization and history lay within the modern Chinese province of Shing-king, and to the Ta-tong river, the boundary of the modern province of Peing-an. The name of the country was Chô-sen (Morning Freshness). The founder of this state was Kishi, an ancestor of Confucius, of which fact the Coreans to this day are intensely proud. They are not, however, ethnically the descendants of the old Chô-sen people.

About the Christian era a race of people from the Sungari Valley began descending to the south, overrunning the peninsula, and thence crossing over into Japan. This race from the ancient kingdom of Fuyu became the progenitors of the Japanese and Coreans. In the peninsula three states, Shinra, Korai and Hiaksai (Chinese, Sinlo, Kaokuli and Petsi), rivals in war and the arts of civilization—borrowed from China, which they imparted to Japan—existed until the tenth century, when political unity was given to the peninsula by the founder of a dynasty that flourished from A. D. 905 until 1392. Subduing the three states to his authority, he named the whole country Korai, and established the capital at Sunto, called also Kai-seng. In 1392, at the time of the beginning

of the Ming dynasty in China, the present ruling family was established on the throne of Corea. The old name of Chô-sen was restored and the present *seoul* or capital chosen, on the river Han, about fifty miles from its mouth. The system of political administration now in force began with the present royal line.

In physical appearance the Coreans resemble the Japanese more than the Chinese. They are, on the average, taller and stouter than the former. The national dress is white cotton cloth, which in winter is well wadded. The strong point in the garb of the official classes is the hat, which on a windy day is, from its amplitude, apt to be troublesome. Their houses are usually thatched dwellings of mud-wattled walls and having three rooms. The warmed floor or platform having a fire underneath is much in use in winter. The women's apartments are secluded with intense jealousy, for the privileges of the weaker sex in Corea are few indeed. However some compensation is found in the curious custom in vogue, at the capital at least, which forbids men, under pain of punishment, to be out at night after eight o'clock. The women, however, are allowed to ramble freely and publicly from that hour till midnight.

The Coreans are very social among themselves, and visits and companies are very numerous. The women living in the interior apartments visit only among themselves. The men endeavor to kill time by meeting together to narrate or invent novelties. The great place of conversation—the club room in every house—is the outer apartment in the front part of each house, and open to all comers. Here the master of the house spends most of his time to receive and treat his guests as pleasantly as possible. Politics are tabooed as a dangerous subject, but the last new events at court or in the capital, the witticisms of this or that personage, stories, anecdotes or discussions on scholastic topics are in order. A great many literary coteries exist, the members of which meet together at stated periods to discuss questions of literary criticism, the sense of passages in the classics. They also read and compare original stanzas and poems. The common people never fail to set their tongues in motion whenever they come together. Strangers meeting, assault each other with volleys of questions as to age, name, occupation, the latest news, etc. A Corean can never hold back anything he knows. He is a perpetually-leaking vessel. To hear the most trivial bit of news and not immediately communicate it to others would be an incredible feat of continence. Always itching for news, the yearn-

ing to spread news is equally great, only that it is accompanied by the malady of exaggeration and fiction. One may easily see what a fine field for interviewers, journalism and newspapers, Corea will be when opened to foreign civilization. The Coreans usually talk in a very high tone of voice, and their social parties are extremely noisy. To cry out as loud as possible is a proof of good manners, and one who would speak in a subdued tone of voice would be looked upon as eccentric. The taste for noise seems to be inborn, and uproar and hubbub are very congenial to them. Like nearly all Asiatics, they study out loud, at the top of their voice, in a manner to nearly deafen an Occidental listener. Laborers, drivers and workers out-doors lighten their toils with songs and chants and beat the Yokohama coolies with their cries. A wonderful medley of street cries is heard in every Corean city. Where men assemble in large numbers to transport heavy loads or haul together, a chanting master is employed to give the note and direct the weird chorus. Nearly every village possesses a band of musicians, having cornets, flutes or cymbals, and nothing is more common than an extemporeaneous concert of the most villainous sounds. An official going abroad, or even leaving his house, is preceded by a crowd of valets who, by their howls and cries, preserve their master's dignity and importance. In the rare instances when the king appears in public, a line of professional howlers is disposed at intervals to keep up an unceasing clamor and prevent a second of silence. The royal dignity is preserved by the lungs of his subjects.

The Corean language, which is now being studied by linguists, shows a surprising affinity to the Japanese. The culture of the learned Coreans is based on the Chinese classics and philosophy. The Corean alphabet and syllabary consists of twenty-five letters, fifteen vowels and ten consonents, classified according to the organs of speech. It is said to be the most perfect in the world. It was invented in the ninth century by a noble. Its forms are straight lines and circles, which were probably suggested by the Sanskrit letters, which were brought to the peninsula by the Buddhist missionaries, who began to propagate their faith in Corea 352 A. D. Buddhism was once the prevalent cult of the whole peninsula, but Confucianism has been since 1392 the paramount religion.

In concluding this hasty abstract of the lecture, we may express the hope that before many years the relations of friendship and commerce may be amicably established between our country and this last of the hermit nations.

## MODERN EGYPT AND ITS PEOPLE.

BY

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EGYPTIAN ARMY.

The subject to be treated in this paper is "Modern Egypt and Its People." It is so vast that several papers would be necessary to cover it entirely. I must therefore limit myself to three or four of the most interesting points, and endeavor to present them as graphically as possible. All that I have to say is the result of my own studies and observations during six years' residence, military service and explorations in that country; so that I speak from experience and not from hearsay.

The first question for consideration is: Who and what are the Modern Egyptians?

To elucidate this question, permit me to mention a few facts and dates.

Egyptian history is the most ancient, and it runs back to a period much more remote than was supposed a generation ago. Some of the latest and best authorities fix the foundation of Memphis by Menes at 4000 years B. C., and the building of the pyramids at 500 years later; the obelisk of Heliopolis and the tombs of Beni Hassan at 3000, all of which necessarily implies one or two thousand years of previous consolidation to create an empire capable of such achievements.

The Egyptian Empire seems to have been more or less autonomous until the Persian conquest under Cambyses, 525 B. C. This was followed by Alexander's conquest in 333, and the Greek empire of his successors subsisted until the Roman conquest, A. D. 30. This was followed in turn by the Arab conquest in 640. Finally the Turks, under Sultan Selim, conquered Egypt in 1517, and hold it to this day.

What wondrous memories cluster around this land of Egypt! The cradle of European civilization, it was recognized by the Greeks as the fountain-spring of all their learning. It was a powerful and

highly organized empire 3,000 years before the Pharaohs of Scripture, as is attested by its temples and its tombs. Its soil was trod by Abraham and Jacob, Joseph and Moses, as well as by Herodotus, Pythagoras and Plato. After the glories of the Pharaohs and the conquests of Cambyses, came those of Alexander. Then followed the Ptolemies, Anthony and Cleopatra, Pompey and Cæsar and Augustus.

To the Christian, Egypt is hallowed as the refuge of Christ himself and by the memories of St. Mark and Athanasius, St. Clement and Origen, and a host of saints and martyrs. Then comes the Arab conqueror Amrou, the barbaric destroyer of all the learning accumulated in the famous libraries of Alexandria. Later on, Haroun-al-Rashid, of romantic memory, and Salah-ed-din, the embodiment of Moslem chivalry, and St. Louis, the ill-fated crusader King. Next follow the long dynasties of the Memlook Caliphs, ended by the Turkish conquest under Sultan Selim in 1517. Finally, near our own times, what heroic figures flit across this Oriental canvas! Napoleon the Great, bidding forty centuries witness from the pyramids the deeds of his legions; Nelson lighting up the mouths of ancient Nile with the conflagration of the French fleet in Aboukir bay. At last, Mohammed Ali, the founder of the now reigning family of Egypt, brings us down to our own epoch.

Observe that since the Persian conquest, in 525 B.C.—that is to say, for more than 2,400 years—Egypt has been continuously under foreign domination, being even now a tributary province of the Turkish Empire and governed by a family of Macedonian origin.

In consequence of these successive conquests there is no country on earth where blood is so mixed as in Egypt; and the more so because of the introduction into the hareems of female slaves from all countries—from the blonde and fair Circassian or Georgian, or the dark-eyed Greek captive, to the bronze-colored Abyssinian and the unmitigated negress of Central Africa. The population of Egypt proper is about five and a half millions; of these four and a half millions are fellaheen Mussulmans, and another half-million are Copts (Christians), but these two are the same stock, being the direct descendants of the Pharaonic Egyptians, the race that built the pyramids and worshipped Amun-Ra. They are the autoch-

tonal race of the land, and exhibit precisely the same type of features and form that we find represented upon the ancient Egyptian monuments.

As one ascends the Nile, the population become darker and darker. Above the first cataract are found the Nubians, or Barabras—descendants of the ancient Ethiopians—who are nearly black but not negroes. In the Soudan, negro blood begins to predominate. To these elements must be added 90,000 Circassians, Jews, Syrians and Armenians, 40,000 Turks and about 100,000 Europeans; and in the deserts, 300,000 Bedouins who are of a type entirely different from all the rest, being nearly all of pure Arab blood. It is usual in common parlance to speak of all the natives of Egypt as Arabs, because the language of nearly all of them is the Arabic, but the name properly belongs only to the Bedouins of the deserts.

Such, then, is the composition of the population of modern Egypt.

Mohammed Ali and his successors having exerted such a paramount influence upon modern Egypt, it is proper to say a few words about them.

Mohammed Ali was born at Cavalla, in Macedonia, on the Gulf of Salonica, in 1769. He followed first the profession of a merchant; but, at the time of the French invasion of Egypt, he joined a corps of Albanians as a subaltern and soon distinguished himself by his valor and skill. After the departure of the French, he allied himself with the Memlook Beys, a powerful military caste, who made and unmade the Pashas of Egypt at their will, with very little regard for the orders of the Porte. In 1806, by their support, he expelled Kosrou Pasha, the Turkish Governor, and had himself proclaimed in his place, winning with his gold the subsequent consent of the Porte. But finding that the turbulent Memlooks would soon treat him as they had done all his predecessors, he resolved to suppress them.

Summoned to the citadel of Cairo on the 1st of March, 1811, for a state ceremony, they repaired there on horseback, about 800 strong. The outer gate, Bab-el-azab, was closed on them, and the first inner gate also. The battlements were lined with Albanian infantry, who opened fire on them and killed all but one—Amin Bey, who leaped his horse over the battlement, a distance of 60 feet. The horse was killed, but the rider escaped unhurt and was afterwards pardoned by Mohammed Ali. After this terrible but neces-

sary execution had relieved him of the yoke of this military aristocracy, Mohammed Ali organized his army upon the European model, with the assistance of numerous French officers, and commenced all these reforms in civil as well as military matters which have placed Egypt so far ahead of other Mussulman countries. He died insane in 1849.

Ibrahim-Pasha, his son, exercised a short time the functions of regent, but died before his father. He was a great soldier, and twice—in 1832 and 1839—he would have driven the Sultan out of Constantinople had he not been stopped in the height of victory by the European powers. After Mohammed Ali came Abbas-Pasha, a cruel tyrant, who died by violence in 1854; then Saïd-Pasha, and in 1863 Ismaïl-Pasha, the son of Ibrahim, who was forced to abdicate a year or two ago.

Ismaïl-Pasha, the deposed Khedive, was once the most belauded of men, as he became afterwards the best abused; yet he might say, in the words of the French poet :

“ Mais je n'ai mérité  
Ni cet excès d'honneur ni cette indignité.”

It would be a great injustice to judge him by the same standard as a Christian prince, yet I affirm that, compared to those who have occupied European thrones during this century, he was greatly superior, as a ruler and a man, to three-fourths of them.

He is of a mild and generous disposition. Compared to Eastern princes, he towers infinitely above them all except his grandfather, to whom he is inferior in native genius and force of will, but whom he greatly excels in general information and in humanity. While the sultans and viceroys were generally regardless of human life, and many of them treated their subjects with cruel barbarity, no such fault can be imputed to Ismaïl-Pasha. What he has done for his country, for the diffusion of knowledge and the progress of civilization, it would take hours to relate. He may have tried to carry his reforms and innovations too fast, and he has been recklessly prodigal, but it must be said that no man was ever so robbed and plundered as he has been. Out of a debt of one hundred millions of pounds Egypt never realized over forty-five millions, and the suffering inflicted upon his people by excessive taxation was partly due to his extravagance, it is true, but more so to the

Shylock exactions of the bondholders, who force the collection of their interest though half the fellahs of Egypt should perish of hunger. Ismail's greatest error was in not tendering a compromise of 50 per cent. of his debt, which would have been accepted gladly, and 3 or 4 per cent. interest, instead of 12 and 14 and 20, which he had been paying for years. Instead of doing this he requested England and France to send commissioners to administer his finances, which ended, as might have been expected, in their taking possession of the whole government and forcing him to abdicate. His son, the present Khedive, has much less ability than his father, and is a mere figurehead, the consuls and commissioners having virtual control. The ex-Khedive and his sons are well educated for Orientals, and in their habits and mode of living, are quite European except as regards the hareem. They all speak French fluently, and are intelligent and industrious to a degree never before found among Mahomedan princes.

Alexandria, or Iskanderia, as the Arabs call it, is the great seaport of Egypt, founded and named by Alexander 332 B. C. It is now as much a European as an Eastern city. Its central portions, and the population you meet there, are essentially French or Italian in appearance, with a large sprinkling of English. But a mosque or an Arab palace here and there, with their gardens of palm trees, and the costumes of the natives, give a local coloring to the scene. The Arab quarters are inhabited by about 200,000 natives, and the European population amount to 60,000 more. Alexandria possesses but few relics of antiquity, her temples and palaces having been destroyed by successive invaders. Alexander's tomb, more or less authentic, is still exhibited in what seems a small and primitive mosque. Pompey's pillar, nearly 100 feet total height, the shaft being of a single piece of red Syenite granite, highly polished, 73 feet in length, was erected about the year 300 of our era, in honor of Diocletian, and had no more connection with Pompey the Great than Cleopatra's needles with Cleopatra. These are two obelisks, one of them now standing in the Central Park and the other on the Thames embankment, in London. They were originally at Heliopolis, but were brought to Alexandria under Tiberius. They bear the hieroglyphics of Thotmes III. (1500) and Rameses II. (Sesostris the Great), 1400 B.C.

The traveller hardly realizes that he is in Egypt until he leaves Alexandria for Cairo. The distance is 130 miles; time, four hours and a half, over a perfectly level country, for Cairo, 12 miles above the apex of the Delta, is only 40 feet above the sea level. The railroad crosses the Rosetta and then the Damietta branch, over splendid bridges of stone and iron. In the spring, the landscape is green as emerald. At every station the crowds of turbaned, swarthy faces, the veiled women, the minarets of the village mosks announce a Moslem land, even without the evidence of the crescents on every public building and railroad station. Some distance before reaching Cairo, looking towards the southwest, three sharp, gray angles catch our eyes, cutting the line of the distant horizon. These are the pyramids. Soon after, we reach the station, are caught up by one of the yelling Arab hackman in his native dress, and swiftly whirled to the "New Hotel"—a showy stone building of 400 feet front, with a double colonnade, facing upon the lovely garden of Esbekieh.

Cairo is the second Arab city in the world, Damascus being the first. It was founded in the ninth century, and was named El Kahireh—the victorious—which Europeans have transformed into Cairo. The famous Salah-ed-din made it his capital about the close of the twelfth century, and founded the great citadel which still commands it. The ancient portion of the city was surrounded with a turreted wall, of which a part still remains, with gates at various intervals. One of the reasons which make Cairo so interesting is that it retains so much of its Oriental character, and another is the continual contrast between modern civilization in its highest forms and the antiquated barbarism found side by side with it. Thus the modern quarters of Cairo resemble the best portions of Paris. Broad and handsome streets bordered with trees, with wide pavements and gaslight in profusion, public fountains and gardens, beautiful stone and iron bridges. The houses are handsomely built, in European style, on which Arabesque ornamentation is frequently applied with happy effect. They are built of cream-colored limestone, and as in this climate there is neither rain nor frost, they are not disfigured by the horrible chimney-pots which spoil the finest edifices of Europe. As long as you circulate only

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in that quarter, you might fancy yourself in a French or Italian city, and the palaces are like dreams of Aladdin's creation.

But just turn the corner of one of these modern streets, and in fifty paces you are in the Arab quarter. The streets, or rather lanes, are but a few feet wide, and more intricate and whimsical in their turns and windings than the labyrinth of Crete. Each story projects over the lower until they nearly meet at the top, so as to shut out the sunlight. Here you are in the country, and you might well fancy in the age, of the Arabian Nights. Here you meet the very characters of that book, the one-eyed porter and the jolly water-carrier, with his bloated-looking goatskin, and the babbling, itinerant barber shaving his customer's head in the street. Here is the veiled lady just returning from the bazar, and the music girl, whom she is taking home to give a fantasia in her hareem to-night. The wicked black eunuch and the hunchback tailor are here also; the shereef and the cadi, here they are, just in the same costumes that they wore 1,000 years ago, for fashions have not changed for longer than that among the faithful Mussulmans.

Look at this grim-looking gate, transported here from an ancient pagan temple, and you would not be astonished if from it issue the Caliph Haroun-al-Rashid with his faithful Mesrour, or the very same three Calenders whose adventures are recorded in the "Arabian Nights," and I could vow that I have seen the very oil jars in which Ali-Baba's forty thieves were scalded to death. There are the same bazars, with the same little shops, mere recesses in the wall, where the merchant, sitting cross-legged, can reach without rising every shelf in his shop. There he sits all day smoking his chibook and waiting for custom. Perhaps a veiled woman is sitting opposite to him chaffering about prices or flirting with him, or else a lady of higher rank astride of her white donkey—does her shopping without dismounting, attended by a eunuch or a servant or two. The flow of life in these narrow streets is wonderful. Crowds of common people in long blue or white cotton blouses hanging to their feet, with a red tarboush (fez) surrounded by folds of white cotton as turbans. The women of the lower class wear nothing but a long, loose gown of deep blue cotton stuff, open from the throat to the waist, around which they wear no sort of belt or girdle. On their heads a long blue veil, tied above the eyebrows

and hanging down the back to the heels, while another long, narrow strip of blue or white hides the face, leaving nothing visible but the eyes which are frequently of marvellous beauty when found in well-matched pairs, which is not often the case.

Besides the multitudes on foot are crowds on donkeys, long strings of burden camels in single file, loaded with building stone and timber or huge bags of straw, and, when the streets are not too narrow to admit them, carriages preceded by their syces. These are footmen who run before the carriage with a long palm stick in hand, crying out, "woah riglak," mind your feet! "emminak," to your right! "shemalak," to your left! not infrequently enforcing the warning with a blow at some unresisting Arab. They are among the characteristic institutions of the East. They are generally Barbarines, nearly black, and are all dressed in the same style. A red tarboush with long blue tassel, a vest of red cloth or green silk embroidered with gold, flowing white muslin sleeves leaving the arm bare from the shoulder. Around the waist a silk or cashmere scarf, and below, white petticoat trousers to the knees, leaving the legs and feet bare. Their endurance is wonderful, and they will run for hours before a carriage at full trot. The syce, who is a necessity in the narrow, crowded streets, serves also as a display of luxury, the great pashas having several of them to precede their equipages.

One of the most picturesque and Oriental sights of Cairo is often beheld on a bright moonlight night. A great handsome carriage, drawn by a pair of large English horses and full of lovely, half-veiled, fair Circassian and Georgian women. Two mounted janizaries, with long pistols in their holsters and curved scimitars at their sides, gallop some twenty yards in front. Behind come four syces, in pairs, with cressets full of burning light-wood, then two more syces with wands. At each side of the carriage rides a mounted eunuch, and a pair of them follow the carriage, and behind them, another couple of mounted janizaries. They pass you at full speed, the flashing of dark eyes mingling with that of diamonds. They are the wives of a prince taking a moonlight drive—but all the guards which surround them are unable to intercept the fiery yet wistful glances of eyes that were made for love, and must know only the slavery of the hareem.

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The contrast of modern innovations and ancient barbarism is of continual occurrence here. Just between the New Hotel and Shepherd's Hotel, in the most frequented part of the European quarter, stands a building whose history brings all the darkness of the Middle Ages in juxtaposition with modern civilization. It is a palace of Arab architecture, surrounded by a palm grove and enclosed within a lofty stone wall. In that palace, less than twenty-five years ago, lived the widowed daughter of Mohammed Ali—the widow of the famous Defterdar, who thought no more of cutting off a head than of slicing an orange. She was a beautiful and talented woman, but licentious and cruel, and many were the victims decoyed into her palace by her emissaries that never came out, except sewed up in a sack to be thrown into the Nile. One of them, however, being well armed, killed four or five of his assailants and escaped. This princess whose power at court was very great, was one of the chief actors in the assassination of her nephew, Abbas-Pasha, in 1854. Said-Pasha—her brother—his successor, was afraid of his ambitious sister and sent her off to Constantinople, where she made herself so dangerous that she soon drank a cup of coffee which disagreed with her, an accident of frequent occurrence with troublesome characters in the East. The story resembles closely that of Margaret of Burgundy, wife of Louis X. of France; but that queen lived 600 years ago, when such deeds were not out of harmony with the times, while the present generation still remember the Princess Nuzla Hanum.

Cairo, seen from the Citadel hill, presents one of the most striking panoramas on earth. This vast city, containing nearly half a million of people, extends over a plain three miles by four between the Nile and the Mokattan hills. The city contains four hundred mosks, besides many tombs of saints and princes, and each has one or more minarets, some of which are extremely beautiful. At the southeast extremity of the city, about 300 feet above it, on the first spur of the Mokattan hills, stands the famous Citadel, the scene of so many bloody tragedies beside the massacre of the Memlooks. It is a small city in itself, three or four times more extensive than the Tower of London. It contains a vast palace, once inhabited by Mohammed Ali, and his tomb in the mosk, which he built of Oriental alabaster and whose minarets are miracles of architectural bold-

ness. There are also large barracks, military schools, all the bureaus of the War Department, arsenals, vast magazines, workshops and a cannon foundry. Also the famous well of Joseph, 270 feet deep, so called, not from the Joseph of Scripture, but from Saladin, whose name was Yusuf. The view from the Citadel hill at sunset is one to be remembered forever. Facing towards the west, you see at your feet the whole city, stretching towards the Nile, with its thousand minarets, its domes, its palaces and its gardens of waving palm trees, the river winding like a silver thread in the distant plain. On the right, the valley of the Nile spreads out into the broad plains of the Delta, while in many places the course of the river and its canals is revealed only by the white lateen sails of the dahabeahs.

Eight miles away, right before you, rise the great pyramids of Gizeh, whose sharp summits tower above the line of the Lybian hills. They stand upon the first elevation above the green valley, and beyond them the Lybian desert stretches without limits. On the left, far up the river, you see the eleven pyramids of Sakhara, and trace the narrow valley of the Nile like a green ribbon between two wastes of yellow sand. All this splendid panorama glitters in the resplendent sunlight of Egypt, under which even the ever-present dust turns to golden glory. As you look, the sun sinks below the desert line until about one-fourth of the disk only is visible, when all at once it disappears at one sudden plunge. Now turn to the left and a little to the rear, and how different the scene! The unequalled moon of Egypt has just risen above the Mokattan range, and its silver light mingles with the fiery glow of departing day. As you now stand nothing lies before you but the tombs of the Caliphs and the Arab cemeteries scattered in dreary ravines of yellow sand. Beyond and around, sand, sand—without a green thing to refresh the eye. Right there at your feet begins the great Arabian desert, stretching away to the shores of the Red-Sea, lifeless, treeless, waterless, broken only by the Mokattan mountains, whose rugged, rocky sides form a fit background for this scene of matchless desolation.

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## THE EGYPTIAN ARMY.

Obliged to select among so many subjects of interest, the next topic to which I will call your attention is the Egyptian army. Under Mohammed Ali and Ibrahim-Pasha, it amounted to nearly 200,000 men, in large proportion organized upon the French system. It was composed mainly of Asiatics from the warlike tribes of Kurdistan, Circassia and Syria, and Arnauts from Albania. After the European powers checked the conquering career of Ibrahim-Pasha, the army was reduced to 40,000 men and rarely reached that number. Of late years it has varied from 30,000 to 15,000 men or less, according to the state of the treasury. Until the late reductions imposed by the Anglo-French commission, the Egyptian army consisted of 22 regiments of infantry of 3 battalions each ; 4 battalions of rifles ; 4 regiments of cavalry and 144 pieces of artillery. It is recruited by a totally arbitrary and irregular system of conscription. The inhabitants of Cairo and Alexandria are exempted—which increases the burden on the provinces. The Egyptian fellah has not the slightest military inclination. On the contrary, the service is horribly repulsive to him, and multitudes used to cut off their right thumb and one or more fingers to avoid it, until they found this would not exempt them. Many a time have I seen gangs of conscripts brought to the citadel in this wise : fifty men in pairs—fastened by the wrists with short chains on either side of a heavy chain fifty feet long. I don't mean that they are *all* brought in this way, but great numbers are, accompanied by weeping women and children from their villages, who wish to see the last of them ; for though the majority return to their homes, yet the time is altogether uncertain, there being no rule but arbitrary will. Nor is there any rule about the age of the recruits, who range from sixteen to forty years, or even more. I once had an orderly, a Copt Christian named Girgis, or George, about fifty-five years old. He said he had been more than twenty-five years in service and, having no friends to apply for his release, he did not know that he would ever be discharged. He was not badly treated by his comrades on account of his religion, though sometimes they would curse him for a Nusrranee, *i. e.*, a Nazarene. The Egyptian soldier is better clad and fed in service than he would be in his native village. The fellahs

from Egypt proper possess a splendid physique, being tall, straight and very well formed. In this they are superior to the line of any army that I have seen in Europe. Their white cotton uniforms (short tunics, baggy zouave trousers, and gaiters over their substantial army shoes) are well suited to the climate and make a very good appearance. They are exceedingly well drilled upon the French system of tactics. The infantry are armed with the best American Remington rifles. The cavalry are extremely well mounted and equipped. The artillery are well organized and have several batteries of the best Krupp guns. The officers are thoroughly acquainted with the routine of service, but the best of them are utterly ignorant of the higher branches of military science. They, as well as their soldiers, understand perfectly all the details of military life. As an instance, in my detachment there was a distinctive bugle signal to call every officer and non-commissioned officer down to the last corporal, and no error was ever made in the call. The soldiers are the most quiet and orderly in the world; never fight among themselves, never drink anything but water, and are the most submissive of men to discipline, as well as the most frugal and abstemious, and yet able to undergo great exertion and fatigue. They are far from being stupid—quite the reverse—and under officers whom they like and respect they perform their service with cheerful alacrity. In one word, they possess all the best qualities of soldiers except *one*—the fighting quality. This probably is due in part to the oppression of centuries, the Egyptian people having been ruled by a foreign conqueror for 2,400 years. How can courage be expected from a race who are accustomed to receive the bastinado as a matter of course from every man clothed in a little brief authority? What motive can the fellah have to fight? Love of country? Why, he has no pride in Egypt as his country; at most, he thinks only of his little village of mud huts as such. Personal honor? There is no word in Arabic for that. He has no character or reputation to sustain; he is Abdou or Hassan or Yusuf, and has not even a family name. What is the regimental flag to him? Only the base on which the companies are formed, a piece of green silk fastened to a pole, and nothing more, instead of being the sacred symbol of his country's honor. Loyalty to his prince? What is the Khedive to the Egyptian soldier but a Turkish oppressor, who

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takes his last piastre for taxes and forces him into the army against his inclination and prejudices? Money? He nominally is entitled to the pay of one dollar per month, but he hardly ever gets it, so that he certainly has not the incentive of good pay which often produces excellent soldiers, as for example, the Swiss mercenaries in France and Italy in former days, and the rank and file of our own army. Why should the fellah fight for his present master when he could lose nothing by exchanging him for another? Only religious fanaticism might stir him up to fight, but he has but very little of it, and it failed entirely in the Abyssinian and Turkish wars. Quite different it is with the Turks, the Circassians, Kurds and Bedouins, who belong to a conquering race and are accustomed to carrying and using arms. The Egyptian army proves that you may take men of splendid physical qualities, clothe them in handsome uniforms, put excellent arms in their hands, drill and discipline them to perfection, and all this will not make soldiers of them unless you give them a motive to fight. It may be asked, would they not fight well under good officers? No doubt they would do better under chiefs whom they respected. The subordinate officers are hardly a shade better than the men, and the high Pashas think only of their ease and personal safety. At the battle of Guy Khoor, in Abyssinia, the Pashas and Colonels, with Prince Hassan at their head, led the flight before the fight had fairly begun, and when my gallant friend General Dye, severely wounded, tried to stem the tide of the retreating troops, the soldiers said to him: "Why should we stay here? Look yonder—see our colonels galloping away into the fort!" And it was only that fort, erected by an American engineer officer (Colonel Lockett), that saved the Egyptian army from a defeat as complete as that of Isandula, for the Abyssinians fight as desperately as the Zulus. It is true that two or three Arab officers of high rank fought bravely and were killed on the field, but they were the exception. Ratib-Pasha, who commanded the army, saw his extreme right flank—one battalion and a battery, which he had imprudently left isolated about twelve hundred yards off—surrounded by a multitude of Abyssinians, who rushed for that gap. Instead of turning his guns upon the enemy and closing the gap, he beheld motionless the complete annihilation of this detachment of which not a man escaped. Then he quickly

ordered a retreat to the fort, and led it himself far in advance. And for this gallant exploit he was rewarded and decorated after the war. You will ask why? Simply because a despotic prince, however intelligent, is always deceived by falsehood and intrigue, and the Khedive has never yet known the truth about the Abyssinian war.

The best regiments in the Egyptian service are those formed of negroes from Central Africa. These are savages captured by slave traders and forcibly taken from them by the Government in order to destroy the slave trade. When retaken from the traders, it is impossible to send them back to their own country, for one-half of them have already died on the way and the rest would perish going back. So the Government makes soldiers of them and gives them the women as wives. Now, let me give you an idea of this mode of recruiting. At El Obeyad, in Kordofan—2,200 miles in the interior—there is a garrison of these troops. Many a time I have seen gangs of twenty or thirty of these recruits, just released from the slave traders, being marched to the barracks by an Egyptian sergeant to be enrolled—great tall fellows, emaciated by fatigue and starvation, all literally as naked as Adam before he dreamt of a fig leaf, and not wearing even a smile, and no wonder. They were in single file, each one fastened to the next by a piece of wood about five feet long, going from the back of the neck of the front man to the throat of the next behind him. Thus they had travelled hundreds and hundreds of miles, never released for a moment except when one would drop dead by the way and would be left as food for hyenas. As soon as they are enrolled they are clothed in a good white uniform, fed on good rations of bread and meat, they who had never eaten anything but grain in its raw state, like camels. They are taught Arabic and the rudiments of the Mohammedan religion; in one word, they are lifted from the condition of beastly savagery in which they were to the primary rudiments of civilization. There is a great deal more fight in these men, who probably were warriors in their own country, than in the fellahs regiments. But looking at these black fellows, all exactly alike in their nakedness, I thought that they never would again be as perfectly *uniformed* as in their black suits of Nature's own fashioning.

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During my six years' service in the Egyptian army, I never knew a case of insubordination or insolence from a soldier towards the Americans or Europeans in the service. We were treated with more respect than the native officers, in spite of our being Christians and foreigners. Officers of high rank, however, especially if Turks, as were most of the colonels and generals (beys and pashas), were looked upon with awe by the soldiers. It is true that none of us were in the line of the army as regimental officers, being all on the staff. Yet when in command of an expedition, I, for example, had absolute authority over the detachment assigned me as my escort. I issued all my orders through their own officers who were held responsible for their execution. All the punishments were ordered by me, generally upon the reports of the native officers; and the most frequent offences were disrespect to the latter. The company officers are so little above the level of their men that they inspire but little respect. As an instance: A captain of infantry of my detachment used to come up every evening to the kitchen-tent to play checkers with my black Nubian cook until I had him put under fifteen days' arrest for it. The punishments for officers are arrest and loss of pay. In theory, no corporal punishment can be inflicted upon a soldier; but in practice it is necessarily otherwise. On the marches the punishments consisted of from two to five dozen stripes with a rope's end. The culprit is stretched on the ground at full length, on his face, and held down by a soldier at his feet and another at his head, while two sergeants administer the stripes over his clothes. This punishment is just severe enough to be effective with a people who cannot be governed without the rod; but it does not approach in severity the bastinado on the soles of the feet, still less the brutal and cruel flogging on the bare back which is in use in the British army. Although I have ordered many a dozen to be inflicted, I never knew a soldier to be unfitted for duty for one hour by his punishment, or to seem to cherish ill-will on account of it.

But a great change has come over the Egyptian army since I left it. In my time, the only jealousy and ill-will that existed towards the American and European officers was on the part of the Turkish and Circassian element which monopolized most of the highest grades. The pashas hated the staff, which they considered as a

check upon their peculations and irresponsible powers, and they were continually intriguing against it. The line-officers, nearly all natives, did not show any dislike to the Christian staff-officers, even if they felt it. When the financial difficulties culminated in 1878, the English and French comptrollers, who had virtually assumed the government, ordered a great reduction of the army and the discharge of all the foreign officers, which resulted in the practical abolition of the staff. There were now left in the army only two elements—the native or fellah, and the Turco-Circassian. The Turks have hitherto occupied nearly all the high positions, civil and military, for they still retain their prestige as the conquerors of Egypt. By the strange customs of those Oriental countries, the Circassians share in this privilege. The tribes of Circassia deem it a high fortune to sell their beautiful daughters to the Turkish pashas and princes, and the white slave market at Constantinople is to-day as abundantly supplied with lovely Circassian and Georgian girls as it ever was. The ex-Khedeive, Ismaïl-Pasha, was a regular purchaser of twenty or thirty of them every year. It is the highest ambition of a Circassian girl to be sold to the Sultan or some of his chief officers. If she succeeds in becoming a favorite, her brothers hasten to share her fortunes by obtaining civil or military appointments. This accounts for there being so many Circassians in high places in Turkey and Egypt. Ratib-Pasha, the Commander-in-Chief of the Egyptian army under Ismaïl-Pasha, was a Circassian. (See Appendix A.)

Until the close of the Abyssinian war, the Egyptian army seemed to be absolutely submissive to its Prince. Numbers of soldiers were shot for desertion, cowardice, and even lesser offences, without a murmur or a protest. But the financial disasters that followed, having compelled the Khedive to transfer the virtual control of his country to Christians, his prestige was broken. Another cause began to operate. The army had become a school of instruction. General Stone, the American Chief-of-Staff, had caused the establishment of regimental schools in which all the soldiers were taught to read and write. The schoolmaster was abroad even in that Moslem land. Signs of opposition to the government began to appear in the army. The first symptom was that military emeute in 1879, when 2500 officers, discharged without being paid, handled

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very roughly the English and French Commissioners and showed but little respect for the Khedive himself. They forced the government to pay their arrearages. This first success seems to have been for the army a revelation of its own power. Ismail was deposed, and Tewfik, vastly inferior in force of character, reigns in his place. Soon after his accession, a Circassian was promoted General over the heads of three native Colonels. The latter sent a protest to the Khedive, who ordered them to the citadel under arrest, but their regiments rose in arms and released them. The Khedive sent two picked regiments of his guards to overawe the mutineers, but they joined the latter and the Khedive had to yield to all their demands, to revoke the objectionable promotion and to appoint a new Minister of War. A few months later another military demonstration forced the government to increase the pay of the army. And now a new rallying cry has been raised, "Egypt for the Egyptians!" Out with Turks and Circassians! Out with foreign Comptrollers who grind out the fellahs for the benefit of foreign bondholders! Arabi-Bey, who is the leader of the movement, is only a Colonel, but all the native regiments are under his influence, while the Turkish and Circassian pashas, unable to command the obedience of the troops, look helplessly on.\* In the meantime, the Assembly of Notables, from whom no opposition was dreamed of (otherwise it never would have been called), claim the right of voting the budget and are sustained by the army. England and France, who in all this Egyptian question seem to have been influenced by no higher motive than to force the payment of the coupons of an iniquitous debt to their bondholders, though it should starve half the fellah population, announce their purpose to support the Khedive (their puppet) against all internal opposition. French and British troops and ironclads will be sent to Alexandria, if necessary. On his side, Arabi-Bey declares that if driven to extremities he will inaugurate the "Holy War," unfurl the standard of the Prophet, summon all the Bedouins of the deserts and drive all the Christians out of Egypt. Such is the present

\* Arabi-Bey surrounded with his troops the Assembly of Notables and dictated their course, which forced the resignation of the Cabinet. A new Cabinet has just been formed (Febr. 5th), in which Arabi-Bey is Minister-of-War.

"Egyptian crisis," and such is the attitude of that army which in former days would have submitted to decimation without a murmur at the command of Mohammed Ali, Ibrahim-Pasha or even Ismail. It must be remembered that the soldiers are in fact the best and truest representatives of the people, from which they are drawn by conscription, and they are the most intelligent portion of the fellah-teen masses, for they have acquired in the army new ideas which would never have occurred to them if they had remained in their villages. It is evident that they are waking up to a sense of their power. Yet it seems most probable that by some compromise with France, Egypt will finally become a British dependency, thus perpetuating indefinitely the subjection of the Egyptian people to a foreign conqueror.

A few words now about the American officers in Egypt. From first to last, between 1868 and 1878, there were about fifty of us in the Khedive's army, of whom eleven died in service or soon after leaving it. When the Khedive had dreams of asserting his independence (before his financial troubles) he found that he could not count upon the European officers in his service, because their governments might, and did, recall them whenever political complications arose. He knew it would not be so with Americans, and our four years' war had given us great military prestige. These were the reasons of his employing so many Americans. Those who had worn the blue and the gray were about equal in number, and never, so far as I know, was there the least unpleasant feeling between us on account of our late struggle. Away from home, we felt that we were all Americans, and were proud to be so. The most prominent were Generals Mott, Sibley, Loring, Stone, who held the rank of Pashas (Generals); Reynolds, Dye, Field, Long, Prout, Lockett, Ward, Purdy and Mason, who ranked as Beys or Colonels. We were all in the "General Staff of the army." Some of us were assigned to duty as engineer, ordnance or bureau officers. Others, among whom I was, were charged with distant explorations in the interior of Africa, which was by far the most desirable duty, in spite of the trying and dangerous climate. Several of my esteemed comrades in those expeditions—Campbell, Losche, Lamson—left their bones in the deserts of the Soudan, and others returned with impaired constitutions. As for me, struck down by insolation due

to the excessive heat at Dongola, eighteen hundred miles up the Nile, I found myself disabled, just after having lost my second in command, Lieut.-Col. H. B. Reed, whom I had been compelled to send back to Cairo for ill-health. The experienced old German surgeon (Dr. Pfund) attached to the expedition assured me that my only hope of life was to get on a boat and float down to Cairo, and that I would certainly die if I went into the deserts. But I knew that if I turned back and left the expedition in charge of the native officers, they would never budge one mile from the Nile, and the expedition, which was very costly and important, would be a complete failure, reflecting much discredit upon the American staff. I considered it one of those cases in which a soldier must prefer his duty to his life, and I started from the Nile for the capital of Kordofan in such a helpless condition that I had to be lifted by the soldiers on and off my dromedary. Two hundred miles I travelled through those fearful deserts to the oasis of El Safi. After resting there ten days I grew worse instead of better. Being now completely paralyzed from the waist down, I was unable to sit either horse or dromedary, and for two hundred miles further I was carried in a litter on the shoulders of four soldiers of my escort, relieved by four others every half hour. Though this service was fearfully hard, and they had to carry me, a Christian and a foreigner, under a temperature of  $160^{\circ}$  at noonday, while the sand would blister their feet through their thick shoes, never once did I hear a murmur or observe even a gesture of discontent from those meek and submissive Egyptians. At last, in the month of June, I reached El Obeyad, the capital of Kordofan, after unspeakable sufferings. There I was joined by that talented and accomplished officer, Col. H. G. Prout, to whom I turned over the command. The surgeon and everybody else gave me up to die, and I thought my days had reached their term. But I began to mend slowly, and after six months I started back for Cairo. Still unable to ride any animal, I travelled twelve hundred miles in a litter suspended between two camels, one in front and one in rear. Thus I crossed in two months (December and January) the deserts that separate El Obeyad from Suakim on the Red Sea, where I took a steamer for Suez and thence by rail to Cairo. All the Americans except Gen. Stone are now out of the Egyptian army, but I can assert with-

out fear of contradiction that they maintained honorably the reputation of their country ; some on the battlefield, several being wounded in the Abyssinian war, and many others having rendered distinguished services in their various spheres of duty.

#### MARRIAGE, DIVORCE AND HAREEM LIFE.

I have reserved for the close of this paper the most interesting of all topics in all times and countries, and that is the fair sex.

It would take several hours to describe at full length the marriage customs alone. I will touch upon them briefly. Marriages are always arranged by the families of the parties. Such a thing as a young Mussulman courting a girl is out of the question, for except perhaps among the lowest classes and the peasantry, with whom nature is more powerful than artificial customs, the bridegroom never beholds the face of his bride until the marriage is an accomplished fact ; so that the experience of Jacob, who married Leah when he thought he was marrying Rachel, is not unusual in the East. But you will see presently that divorce grants them a speedy release if the bridegroom desires it. In all cases he gives the bride a stipulated dower, which may be ten thousand pounds, or only a few shillings, according to their station in life. Of this he always retains one-third, to be paid her in the contingency of divorce, which is of course considered a probable event. On her part, she brings her marriage portion which is absolutely hers, and she takes it back in case of separation. The marriage proceedings are quite long and complicated among the higher and middle classes, and a week, or even two or three are spent in various festivals and ceremonies between the conclusion of the marriage contract and the day that the bride is taken to her husband's house. Among other ceremonies performed during that period are processions through the streets—in carriages and with bands of music if the parties are wealthy ; on foot and with only a couple of flutes and a tambourine if they are not. In a bridal procession of the common people the bride walks under a canopy. She wears a red shawl which covers her head and face so entirely that she has to be led by two female friends who guide her steps. They stop every two or three hundred yards while the discordant music strikes up and a hired male dancer goes through some absurd contortions. Meanwhile the bridegroom is having his own

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separate procession in another quarter and far away with his friends to the bath and the mosk, but the two never meet or mingle. The marriage ceremony itself is very simple and is performed by the cadi, who is a mere civil magistrate. It is well known that in Moslem countries women hold an inferior position. They are kept strictly guarded, and among the wealthy classes they are never allowed to go out unattended by eunuchs. The necessities of life give more liberty to the women of the middle and lower classes, but even these are subjected to many restraints and exclusions. There is no such thing as social life or intercourse in which the sexes meet together. The women receive their female friends in the hareem'\* at which time the master cannot enter therein, and the husbands entertain their male friends in the salamlik, or outer hall, beyond which no male stranger is allowed to penetrate. No Mussulman above the lowest class ever appears in public with his wife or wives, and when a wealthy family travel, the husband and master goes by one train and his hareem by another. Even the ex-Khedive and his sons, who are so greatly Europeanized, have to conform to these customs. In the splendid opera house at Cairo, the Khedive and the princes have their boxes on the right of the stage, and other boxes on the left are reserved for the princesses and entirely screened with gauze which makes the ladies invisible, while they can see the stage and the audience. The princesses come and go in their own separate carriages, attended only by numerous guards and eunuchs. At the magnificent balls given by the Khedive, he and the princes and many Europeanized natives of high rank mingle in the dance with the European ladies, but not a single native female is to be seen. The utmost liberty granted the hareem ladies on such occasions is a glimpse at the ball-room from gauze-shielded galleries. Nor do the sexes ever eat together even among the lower classes. At one time, in Cairo, my windows commanded a view of a grocer and fruitseller's shop who seemed to have a prosperous trade, in which he was assisted by his wife and little daughter. The wife would prepare the meals and wait upon her lord, and when he had finished eating, then the

\* I use the Oriental pronunciation with accent on last syllable. Hareem' means cut off, viz. : sacred to the females alone—and by extension denotes all the female household.

wife and child would eat separately in another corner of the shop, while he sat at the door smoking his cigarette. It is a gross breach of good manners to inquire of a Mussulman even about the health of his hareem, and good breeding requires one to appear utterly unconscious of the existence of the female household. The Mohammedian laws and customs of marriage and divorce are very similar to those of the ancient Hebrews, and the manners and ideas as well as the morals of the Mussulmans, with regard to women, are very much such as pictured in Scripture of Abraham, Jacob and Judah, David and Solomon and a host of other patriarchs. There is, in reality, but one restriction. No one must interfere with his neighbor's hareem. Yet, Mohammed's legislation was a limitation of the system of polygamy existing before his day. Solomon had seven hundred wives, according to Scripture. The Mussulman law limits to four the number of a man's *titular* wives, but it gives him entire possession, if he desires it, of all the women in his hareem, whether wives or slaves. Their number is limited only by the means of support. To give you an idea of the magnitude of some of those establishments, I will state that Princess Mansour-Pasha, one of the ex-Khedive's married daughters, prides herself on her moderation in having only 250 female slaves in her hareem, while her sisters are not content with less than 500. The number of male slaves and attendants in the husband's establishments corresponds, for it is in this that a wealthy Mussulman exhibits his pomp and pride. It is true that of this vast number of women, nine-tenths are mere servants and menials for the favorites, but any one may be raised to the rank of a favorite, or even a wife, by the master's caprice; for if he has already four wives, he has only to divorce one to make room for a new favorite. It is said that Mussulman women, knowing no other state of society, are generally contented with their condition, and perhaps it may be so. But it is certain that the most frightful tragedies sometimes take place in the seclusion of the hareem. Rival favorites use every means to supplant each other, and wives, fearful of being divorced for a new caprice, employ poison and the dagger to remove a dangerous rival; and for each one of these tragedies that accidentally comes to light, how many remain forever unknown!

It is impossible to form a just conception of Mussulman society

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without bearing in mind the fact that the Koran is a complete code of laws, not only religious, but civil and political. Hence it is that while Christians can govern Mussulmans with justice and impartiality, because they recognize the equality of all men before the law, Mussulmans cannot govern those of other religions in the same way, because the Koran proclaims the superiority of believers over unbelievers. Thus the testimony of unbelievers avails nothing in a court of law against that of a Mussulman. The Koran asserts that one eye of a believer is worth two of an unbeliever, and there is no comparison between the value of the life of a Mussulman and that of a Giaour. You know that for three years Russia, in concert with the other powers, has tried in vain to obtain from the Porte the execution of the murderer of Col. Comeraoff. He was sentenced to death long ago, but the execution has been avoided under various pretexts, the last of which being that he has become insane. It will be the same thing with the murderers of Dr. Parsons, the American missionary, and they will never be hanged unless the United States send a squadron to require it. Our Secretary of State in his last report states that the demands of his department on this subject have been evaded. Now, it seems a small thing for a great nation to demand the execution of an obscure murderer, but a great principle is here involved. If the victims had been Mussulmans their murderers would have been hanged long ago, but it is against the conscience of Mohammedans to punish with death one of their co-religionists for the murder of an unbeliever. Hence the necessity of teaching them by stern examples that the life of a Christian is as sacred as their own.

Now, the Koran regulates all the domestic life of the Mussulmans, and the hareem is placed under its sanction and safeguard; and as it gives to the master entire and absolute possession of all the women in his hareem, it makes no discrimination between the children born in it, whether of a wife or a slave. They are all equally legitimate and have equal rights. The present Khedive is the son of a slave, whom Ismaïl-Pasha afterwards raised to the rank of a wife. It is the same with most of the Princes, for it is usual when a favorite slave bears a son to elevate her at the expense of a former wife, until she is in turn displaced to make room for a younger favorite. It is true that for the sake of peace or economy the great majority

of Mussulmans have but one or two wives—at one time; but divorce is accomplished with a speed and facility which leave far behind the most expeditious and liberal courts of Chicago or any other place.

The wife cannot divorce her husband, nor force him to divorce her, but he has only to say "Entee talleekah"—Thou divorced—and the matrimonial bond is dissolved. He is bound only to give her the unpaid third of her dower, and an alimony proportional to their rank in life for three months, after which she can marry again. Multitudes of Egyptians in moderate circumstances are married and divorced several times a year. A man may divorce his wife and be married to her again; he may do it a second time, but if he divorces her a third time, he cannot remarry her until she has been married and divorced by another man. All these laws are in the Koran. The triple divorce may be pronounced in one sentence: "Entee talleekah beetalateh"—Thou divorced triply. Sometimes an enraged husband, in a moment of passion, rashly utters this dread formula, and he repents quickly; but it is irrevocable before the law, though the party will sometimes get around it by denying his having uttered the triple formula, if no witnesses were present to hear him. Otherwise an old man, generally a blind beggar, is offered a few pounds on condition of marrying the divorced wife before the cadi and divorcing her immediately afterwards. This satisfies the letter of the law, but it happens occasionally that the beggar refuses to divorce the woman, and as no law compels him to do so, he raises his demands and makes the repentent husband pay dearly before giving up the wife.

The "oath of triple divorce" by which a Mussulman binds himself to do a certain thing, failing which, to divorce triply one or all his wives, is considered the most binding of all. On my first expedition in the Eastern Desert, we were escorted by Mohammed Khalifa—the great Sheikh of the Ababdehs and Bishareens, who ruled over more than 70,000 of those Bedouins, and had boundless influence over them. After remaining in the desert with us for some six months, he conceived that his affairs called him to the banks of the Nile, and made his preparations to depart, leaving the Bedouin guides and drivers in charge of his nephew. But they had no confidence in the latter, and on the night preceding the depart-

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ure of Mohammed Khalifa, they assembled at his tent door and notified him that if he left they would all leave also and abandon the expedition right there in the desert without guides or transportation. He endeavored to argue the case with them, when, to cut short all discussion, they all took the oath of triple divorce in his presence—that if he left, they would leave also. There were but two alternatives. If he went and used his authority to compel them to remain, then all their wives were divorced for ever. His generous soul shrank from the awful idea of making so many grass widows at one fell swoop, and he remained.

On my second expedition to Kordofan, one of the soldiers of my escort, rejoicing in the name of Abou-la-nane, came to me on the eve of our departure from Cairo, and stated that he had married a wife from a village far up the Nile. Would I permit him to take his wife on the boat and leave her at her village with her relatives; otherwise she would starve from misery in Cairo. This was probably a subterfuge, but I consented. Arriving at the village after several days, Abou-la-nane came and said that all his wife's relations were dead, and if she was left there she would starve more certainly than in Cairo. "Would his Excellency the Bey (that was myself) permit him to take her along?" I told him that if he did she would certainly surely die in the desert from the hardships we would have to encounter, and which none but strong men could hope to resist. But he was a good casuist, this son of Islam, and he argued that she would certainly die of want in her village, but she might survive in the desert. Finally he gained his point. The fact is, she was a useful servant to him, as are all wives of the lower class. She cooked for him, brought fuel and water, kept his clothes in order as well as the little shelter-tent, which he had blarneyed the Arab quartermaster to let him have for their separate establishment. From my observation, they got along as well as most couples in their rank of life. When she displeased him he used to administer a gentle correction; but it was done in a paternal way, and not at all in that brutal style of wife-pounding that is too often seen in Christian lands. One night at Dongola, on the Upper Nile, after retreat, the whole camp was startled by the wails and moanings of Hafizah, the soldier's wife. He had become jealous of the attentions of the sergeant of artillery, and in a fit of rage he pronounced the

dread sentence: "Entee talleekah beetalateh—Thou divorced thrice." She published her woe to the world, and invoked all the curses of Allah and his prophet on her husband's father, and his father's father, and all his forefathers to the remotest generation, according to the retrospective Arab manner of cursing in the oblique cases, never like the Saxon who blanks your eyes and blanks your soul with the most refreshing directness. "Might the dogs defile his father's grave for bringing her so far from home to divorce her in a strange land and leave her to perish!" By the time morning had come, it repented Abou-la-nane, the having divorced his Hafizah. But what was to be done? The sentence was irrevocable. Fortunately there were no witnesses, and he stoutly denied having used the triple formula, only the simple one. So they went before the cadi and got married again, and everything was altogether lovely. I may as well state here that my kind treatment of Abou-la-nane and his wife was "bread cast on the waters." When in the heart of Kordofan, soldiers and servants were dying or prostrated by fevers, and I was at the point of death, this little weak, puny woman was never sick a day, and did all the cooking and washing at headquarters when no one else could be found to do it. When I was transported back to Cairo, Abou-la-nane was detailed as one of my escort, and he returned safely to Cairo with his wife.

Another anecdote to illustrate matrimonial customs:

The house in which I dwelt the last four months of my residence in Egypt was in Alexandria, just behind the English church. It is a large okelle, as such blocks are called, belonging to the monks of Mt. Sinai and is let in suites of apartments. The wide and spacious archway leading to the court-yard was the residence of the janitor, or bowab, as they are called in Arabic.

His name was Mustapha. He was about fifty-five, very ugly and wrinkled and had but one eye. His wife Fatma was at least twenty-five years younger, tall, well-formed, good face and color, and could pass for a handsome woman, though she also had but one eye, according to a very prevalent fashion of the country. Their house-keeping was patent to all the world. Mustapha's income was \$6 or \$8 a month. His worldly goods consisted of a couple of palm-stick bedsteads, two or three mats, a water jar, a small portable charcoal furnace, and that, with very paltry wearing apparel, summed up all

his possessions. But a generous soul soars above riches. Mustapha's ambition was to have offspring to which he might bequeath this vast estate. I can't say his name, for the Arabs have no family names, and Mustapha's son, if he had any, would be called Hassan, or Mohammed, or Ibrahim.

Now, Fatma had been his wife many years and had borne him no children, and she had no maid-servant to give unto him, as Sarah gave Hagar unto Abraham. So he married a younger wife who dwelt in another house, where he visited her daily. From that moment peace forsook the okelle of Mt. Sinai. Every day Fatma, awaiting his return, opened fire on the devoted head of Mustapha, and going out into the street called upon all the passers-by to hear her wrongs. He, leaning against the door-post, smoking his chibook, would pay no attention. The natives would stop according to their custom—water-carriers, sheikhs of religion, fruit sellers, women and soldiers—each giving his advice and opinion, without effect upon the stolid Mustapha, until at last Fatma, driven to frenzy, would gather up mud to throw on his beard and thus force him to flight. After a few weeks of this warfare he gave in. I suppose Fatma was the more useful servant, as she did all the work of keeping the yard and stairs clean, beside cooking and washing for her lord. So he concluded to divorce the new wife, yielding up the balance of her dower—about six shillings—and paying her a munificent alimony of five cents per day for three months, after which she would be at liberty to marry again. It is to be observed here that in case of divorce the children must be supported by the father; and if a slave is raised to the rank of a wife and afterwards divorced she is free forever. The results of this facility for divorce are horribly demoralizing, for after a native woman has been married and divorced by two or three husbands she generally becomes an outcast from decent society.

The Moslem woman, even of the highest class, being entirely uneducated, generally unable to read or write, leads a life of physical enjoyment, of which indolence is the chief element. Even the accomplishments of music and dancing are very unusual. The Arabs, male and female, are too lazy to practice them themselves, though they like to hear music (or what they call such) and to see dancing by professional performers. The only pastimes of hareem

life are visiting and gossip, a very little embroidery and needle-work, drinking coffee and sherbets, playing games like checkers or drafts, smoking cigarettes or nargileh and the pleasures of the bath. Women of all classes are required by the Koran to wear veils over their faces outdoors and never to show themselves unveiled to any man, except their fathers, brothers and masters. The women of the people wear a thick black veil or sometimes white, from the eyes down, and their garments are fashioned just as they were a thousand years ago. The higher classes imitate as much as they can the European fashions, and their thin white veils, worn over the nose, mouth and chin, hardly conceal their features. In fact, it is noticeable that the thinness of the veil always increases in direct proportion with the beauty of the face. The European ladies who visit the palace report that the princesses receive them in complete Parisian costume (generally in bad taste), which is quite a disappointment to seekers of Oriental display.

The hareem system would be impossible without eunuchs. Every Mussulman who has as many as six or eight women in his hareem must have at least one eunuch to guard them. These creatures are all Nubians and are bought when about fifteen at extravagant prices from the Christian Coptic priests of the Upper Nile, who have the monopoly of the shameful traffic. Thence they are sent to Egypt, Turkey, Persia and all the countries where the Mohammedans are rich and numerous. The eunuch, nominally bought as a slave, is never sold again, and becomes in fact the real master of the house which he enters. He is the right hand of his lord, who relies upon him for the guardianship of his most precious treasure. And his power over the women is unlimited. It is from him that they must obtain any unusual indulgence, such as pleasure trips, pic-nics, drives, visits to other hareems, &c. And should he conceive a hatred for one of them he has only to accuse her of some intrigue, truly or falsely, and her life will pay the forfeit, for no police or other inquisitorial power will ever dare investigate what takes place within the sacred precincts of the hareem. The consequence of this is that they all get rich, all the money and jewels given by a Mussulman to the women of his hareem finding their way, sooner or later, into the pockets of the eunuch. Not only do they acquire wealth, but political power. The

Sultan's Kislar Agassi, or chief eunuch, ranks as a Minister of State, and is the fourth personage in the empire. The chief eunuch of the ex-Khedive's mother was one of the most influential persons in Egypt. His income was \$400,000 a year. All those natives and foreigners who desired to obtain position, or fat government contracts, offered bribes and paid their court to this black Nubian, and would even kiss his hand in servile homage. (See Appendix B.)

There is no hope of complete regeneration for Mussulman countries except in the suppression of the eunuch, and the consequent downfall of the great hareems. The small ones would follow in turn, and woman might then hope to assume her rightful place in Oriental life.

Of late years, the Khedive, the Queen-Mother and the Princesses have established and encouraged female schools for the education of the native women; but Moslem laws, customs, traditions and religion are so much opposed to the instruction of women, that a long time must elapse before this movement has any tangible effect upon Mussulman society. Of so little moment has female instruction been considered, that girls are rarely taught to read, and more rarely to write. While boys are made to learn the Koran by heart, as well as all the various forms of prayer which constitute the Moslem ritual, girls receive but very little religious instruction of the most summary description. But yet it is not true, as is generally asserted, that the Mussulmans believe that women have no souls. The Koran expressly says that they may enter Paradise. Yet their inferiority to man, both in this world and the next, is a cardinal dogma of their religion. The *least* of the believers, says the Koran, will be cheered in Paradise by the company of seventy-two lovely houris, possessing every ideal female attraction; and, it adds: "He shall have also the wives whom he had in this world (but with the saving clause) provided he desires to have them." So that even in his Paradise the Mussulman is to be the master of woman's fate, so different is the Moslem world from ours, where woman, generally, is the ruling power of man's destiny.

From the picture which I have tried to present you of some salient points of Mohammedan society, I feel sure that all that have read this, but especially the ladies, will conclude with me that we have every reason to thank Heaven that our destinies were cast in a Christian land, and that we are blessed with the ennobling influences of the Christian religion and civilization.

## APPENDIX A.

## SLAVES IN THE EAST.

(*Correspondence of the Manchester Examiner, 1881.*)

The headquarters of the white slave trade in Constantinople are in the Bostandchi quarter, which comprises a number of small, narrow streets between Pera, Galata and Tophané. The trade is conducted almost exclusively by a tribe of Circassians known as Tersirdchis. Families generally work together. One brother, for example, stops at home and minds the shop, while the other goes and purchases and forwards the raw material of the commerce. Negotiations with purchasers are conducted through the intermediary of Arab brokers, who call regularly on their patrons to inquire if they are wanting anything in black eunuchs or white girls. The rendezvous of these gentry is a coffee-house in the Bostandchi quarter, the entry to which is strictly forbidden to all save followers of the prophet. A white boy, in good health, from eight to fourteen years old, costs from \$180 to \$200; if he has any acquirements, such, for instance, as a knowledge of cookery, or other housework, he will command twice as much. A girl under ten years old may be had for \$100, while a maiden between twelve and sixteen, especially if she can read and write and strum a little on the zittar, is worth \$3,500. A female slave of exceptional beauty, young, white and a virgin—the style most in vogue are blondes and black eyes—fetches from \$4,400 to \$6,000. For a choice specimen, with a smattering of French, and able to play a few airs on the piano, a rich amateur has been known to pay as much as \$12,200. But, as may be supposed, the demand for articles of this description has greatly fallen off since the halcyon time of perpetual loans and profuse expenditure. Black slaves, who are brought principally from Africa, are either sold direct by the importers to the proprietors of harems or to dealers, two of whom have extensive marts in Stamboul. These two generally keep on hand 100 to 120 slaves each. There are also depots in Scutari, and in several villages on the Bosphorus. A strong black slave sells for about \$90; a black maiden, \$67 to \$75; a eunuch, \$315 to \$400. Not the least interesting part of the account from which I quote is the writer's descrip-

tion of his visit to a slave dealer's den in the neighborhood of Scutari, the exact locality of which he was sworn not to reveal. His companion was an Arab broker, whom he had to backsheesh heavily for his services. He assumed the character and presented himself in the garb of a Hungarian renegade officer in the Turkish army, the ostensible object of his visit being the purchase of a halaiks or house slave. The slave dealer's warehouse was a large wooden building; the slave dealer himself, a dignified Turk of the old school, bearded, turbaned and loftily polite. Pipes and coffee were of course produced, and, after a due interchange of complimentary phrases, business began. The dealer's head man, Hassam, a gigantic Nubian, was summoned and told to bring forth a number of slaves for the inspection of the broker and his friend. Thirty negro women, of various ages, and a number of boys were then led into the room. These the broker, who had really a commission to buy two or three slaves, looked carefully over, made them open their mouths, pinched their ribs, tried their wind and examined their "points" as a horse dealer examines the points of an animal which is offered to him for sale. In the end two women and one boy were selected as suitable for their purpose. Then began a long and almost interminable wrangle. The dealer asked \$900. The broker laughed him to scorn and offered \$60. Whereupon the Turk waxed scornfully indignant, but in consideration of the rank of his guests offered to come down to \$220. Then more coffee and fresh pipes were ordered, and, after a tremendous palaver and an immense consumption of tobacco, the lot was knocked down for \$190. The purchase, it was agreed, should be sent for and the dealer's little bill settled on the following day.

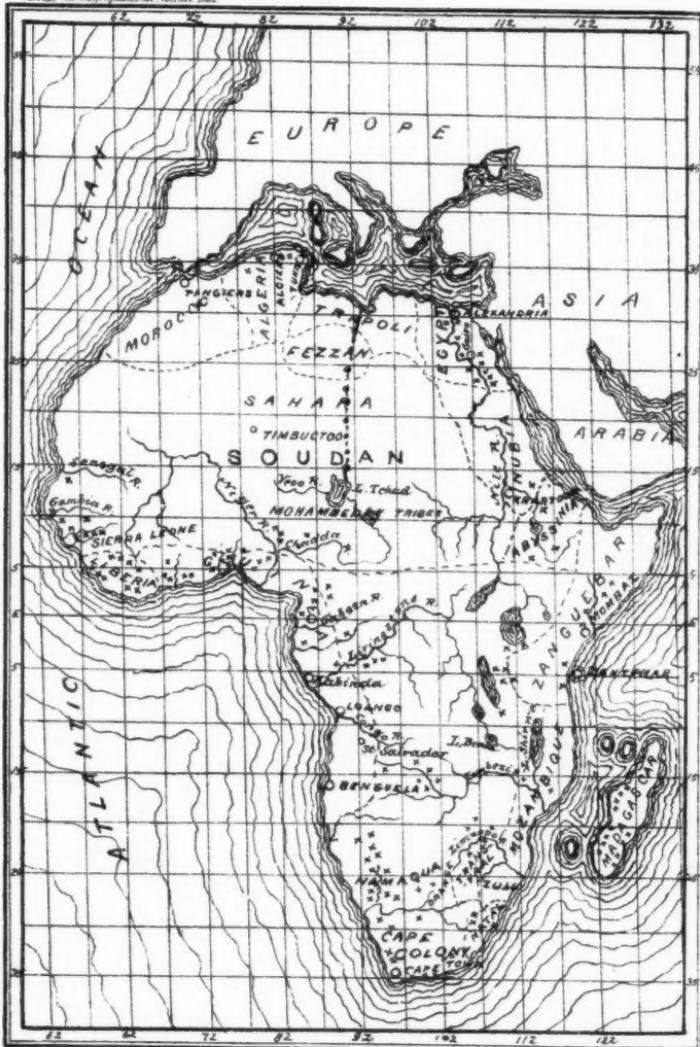
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#### APPENDIX B.

"CHIEF OF THE EUNUCHS."—A correspondent of the *Allgemeine Zeitung*, writing from Pera (1881), describes at length a remarkable ceremony, which seems to be curiously out of place in Europe—the installation of the new Chief of the Eunuchs over the harem of the Sultan. It was a genuine piece of old Turkish conservatism. The name of the new "Kislard Agassi," or Head Eunuch, is Stasis

**Behram Aga.** The Turkish journals give long descriptions of the function, and publish odes and chronograms in honor of the hero and of the great event. The poets expect to gain something in return for their amazing adulation. The new dignitary holds a very lofty and influential position in the system of the Porte; only three persons stand higher than the Head Eunuch—namely, the Sultan himself, the Grand Vizier and the Sheik-ul-Islam; but he, from his position, frequently exercises a more direct influence upon the Sultan, and so upon Turkish politics, than either of the other two eminent officials. The new "Kislar Agassi" was received at the Imperial Palace of Dolmabagdsché with the most gorgeous pomp. All the sentinels of the imperial harem, armed with halberds, formed a *spalier*, and "His Excellency Behram Aga, Chief of the Eunuchs," rode past on a magnificent charger, the orders of the Osmanie and Medschidje glittering on his breast, followed by Ahmed Bey and a number of the adjutants of the Sultan. When he arrived at the gate of the palace, lambs were slaughtered before him as a token of welcome. He was received with the greatest awe by the religious and domestic servants of the imperial household, including the most reverend the Imaum of the Palace and several distinguished mollahs—perhaps chaplains in ordinary to His Ottoman Majesty. The Sultan sent across to his new official two symbols of office, a written document and a magnificent silver pastoral staff worked in relief, which is never handled by any but the Agas of the imperial harem. The new Head Eunuch solemnly kissed the parchment and the staff. The imperial "hatt" was read, some prayers for the blessing of Islam upon the new pastor of the Sultan's women were said by the clergy, and then the new "Aga of the Sublime House of Blessedness," as the Sultan's "hatt" calls him, was allowed to enter the harem and inspect his future dominion.

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### RESOURCES OF AFRICA.

CHANNEROT MEMOIR.

Translated by Gen. E.L. Viele.

## THE RESOURCES OF CENTRAL AFRICA.

M. CHANNEBÔT'S PROJECT FOR THEIR DEVELOPMENT BY A RAILWAY  
FROM THE  
MEDITERRANEAN TO THE SOUDAN.

TRANSLATED FROM THE FRENCH BY GENERAL EGBERT L. VIELE,  
MEMBER OF THE COUNCIL OF THE SOCIETY.

The deep interest that for a long period of time has been felt throughout the civilized world in regard to the equatorial regions of Africa, and the earnest desire to obtain a more accurate knowledge of that mysterious region that seemed to be forever guarded by the silent and repellent forces of nature that bid defiance to human efforts to unlock its hidden secrets, have stimulated to a very high degree the enthusiasm of explorers. Recent years have witnessed the most heroic efforts of explorers, of various nationalities, to overcome the fearful obstacles in the way of definite information concerning that hitherto unknown country. Following these efforts, a utilitarian age demands of science and skill some method by which the world shall be not only wiser, but richer for the knowledge that has been obtained at so much cost and sacrifice of valuable lives. As one of the means for utilizing this knowledge, the memoir is herewith presented, which has emanated from a nationality that, more than any other, has endeavored, while carrying "the war into Africa," to carry with it the elements of a higher civilization.—*The Translator.*

### PREFACE.

The Soudan is that region of Central Africa which is situated south of the deserts of Sahara and Lybia; it extends from west to east, a breadth of 34 degrees; and from north to south, a length of 11 degrees, and has thus a total surface of about six millions of square kilometres.

The population is not less than 35,000,000.

Under the influence of tropical rains, its soil is of marvellous fertility. From corn, millet, buckwheat, rice, to pepper, coffee, cotton; from sugar-cane to wheat; everything one can desire will grow.

The explorers are all of one accord as to the small cost of everything in the Soudan. Corn often is worth scarcely more than the fifth part of a cent. A good horse or a strong camel costs thirty francs (\$6). An ox or a milking cow is worth from seven to eight francs (\$1.75). One can buy there a couple of excellent sheep for three or four francs.

Thus the Soudanians, for their daily wants, have been forced to invent a currency of almost infinitesimal value, such as little bands of cotton, or small shells, called "kourdis." A Prussian thaler is equal to 1,300 kourdis.

The eminent Jules Duval, so competent a judge in commercial matters, states that "gold in the Soudan is only estimated at a third of the value attributed to it in Europe, while European merchandise, once arrived in the Soudanian region, acquires a triple value."—(Extract from the Universal Dictionary of Commerce and Navigation.)

This strange and quite abnormal condition of things is explained by the geographical situation of the Soudan, by the difficulty of reaching it, by the necessity of having the merchandise conveyed thither, and delivering it to very unscrupulous intermediaries.

In fact, not only does nature seem to have enclosed the Soudan, from the European side, in a large belt of deserts, but the semi-barbarous nomads, the Tebbous and the Touareks, who people the Lybian and Saharan oases, as much by fanaticism as by mercantile interest, have undertaken to discourage European merchants from penetrating into the Soudan, and have thus constituted themselves the sole purveyors of the Soudanian region.

In spite of them, however, some explorers have been able to penetrate into the Soudan, to sojourn there, and their narratives and studies have been sufficiently complete to enable all the world at this day to form an exact idea of this country.

We can therefore say with confidence, that it is time to put an

end to this kind of sequestration by fanatics or deliberate barbarians of a territory so rich and thickly peopled as the Soudan.

The Soudan must henceforth be opened permanently and in an indestructable manner, both for men and commodities.

Science, in our century, in order to triumph over obstacles offered either by man or nature, has created an engine which nothing can resist; an engine which devours space and does violence to nature; an engine which compels the light of civilization to penetrate into the most secluded dens of fanaticism and barbarism.

This engine is the locomotive—the railroad.

The Soudan is, they tell us, 500 leagues from any civilized zone. It takes weeks to get there.

We reply: The railroad will in six days convey merchandise and travellers from the Mediterranean coast to the shores of Lake Tchad, that heart of the Soudan, in the country of Bornou, so justly styled the "garden of the Soudan."

The present commerce of the Soudan is valued at five hundred millions of francs a year. We can affirm that with the rapidity and security of communication, this commerce would increase tenfold before long.

Does not the activity and energy that the English display in Morocco and on the coast of Guinea indicate to us the value they attach to avail themselves as much as possible of this commercial market of the Soudan, the importance of which Mungo Park, Lander, Caillé, Laird, Oldfield, Barth, Livingstone, and all the explorers of Central Africa are unanimous in asserting?

Do not the efforts of the Egyptian Government in the Upper Nile, and the recent conquest of Dar, all also indicate clearly the interest that the Khedive attaches to the importance of turning towards Egypt the greatest possible portion of Soudanian commerce?

Now, from Mogador, the last port of Mavoc towards the south, to the great Soudanian market of Kano, merchandise must follow a route all bristling with difficulties from the desert, and which extends a length of nearly 4,000 kilometres. From Alexandria, through Egypt by the Nile to Khartoum, from thence through Kor-dofan, Darfour, Wadai, to Lake Tchad, there are nearly 5,000 kilometres.

The river route, the Niger, which penetrates deeply into the

Soudan, forces merchandise and travellers to a still more considerable circuit.

It is to these routes, so long, so difficult, so perilous; to these journeys so costly of time and effort, that we propose to substitute a railroad; starting from the centre of the Mediterranean itself, some hours only from Brindisi and Malta; a railroad that would be like the prolongation of the African continent, in the direction of the equator, of these great iron roads, which, setting out from Calais and Anvers, put all the great commercial cities of Europe in direct communication with the mail of India and China.

The "Soudan-Mediterranean" will be 2,434 kilometres from the sea to Kouka, capital of Bornou. It will be without a tunnel. It will not need a greater elevation than 624 metres above the level of the sea, by ordinary grades of 0.007, 0.008; and only two grades of 0.015 for a distance of five kilometres.

It will touch towns, villages, oases. It will traverse fertile valleys, and in the present condition of things, in its entire length, fifty-eight stations, at least, exist, in the form of wells, assuring to it nearly all the water necessary for the engines. The greater portion of the desert that it will have to traverse does not exceed 126 kilometres; this is the desert of Tintouma.

The railroad will set out from Cape Misratah, where the coast is free, with a cut of from nine to eleven metres.

It will touch Sokna, a little town, famous for the date-trees in its suburbs. It will reach Mourzourk, capital of Fezzan. It will then skirt in all its length the valley of Konar, all sprinkled with oases; it will then come to Bilma, so celebrated for its salt mines, and which is the general rendezvous for all the caravans of the north of the Soudan. At last it will reach Lake Tchad and this part of the Soudan, called Bour nou, of which the territory is so fertile; and it will stop at Kouka, the actual capital, where living is so cheap.

Could competition to such a line be possible? Would not this line immediately obtain, by the sole force of circumstances, the monopoly of the commerce between the Soudan and Europe? As to the Soudanian commerce itself, would not the construction of this iron road incite it to increase tenfold before many years?

It seems useless to us to insist upon these points. The tracing of the "Soudan-Mediterranean" line and the comparison with the

other actual or possible routes, as well as the study that all the world can make of the resources of the Soudanian region, assure us of the success of such an enterprise.

## DESCRIPTION OF THE SOUDAN.

The Soudan, or Beled-es-Soudan, "country of the blacks," is the common name given since the Middle Ages to the immense region which touches on the north the deserts of Sahara and Lybia, and prolongs itself towards the south to limits not yet determined and to regions still almost unknown at the present day.

In fact, it is only within the last few years that explorers, in ascending the Nile, or in setting out from Zanzibar, have been able to recognize the existence of those great lakes, of those vast reservoirs of which Herodotus had transmitted to us the idea. Doubtless the Portuguese, in the last three centuries, penetrated very far into Nigritia; doubtless both merchants and missionaries founded in the interior settlements and establishments which prospered for a long time; doubtless there remains to us from all this a certain number of ideas on the subject of the mineral riches of the country. But these notions are obscure and confused, like those we have of that great lake described by Piaggia, and which probably gives birth to some great stream.

In contrast with Southern Nigritia, of which the territory is, however, furrowed on all sides by great streams, which place it in direct communication with the ocean, the Soudan proper, which is also called "Takroud," or "Asnou," if we except the western portion, which is traversed by the Niger and its affluents, the Soudan, we say, surrounded by high mountains or vast deserts, seems as though isolated from the world and accessible only with great difficulty.

Nevertheless, since the commencement of this century, travellers, in considerable numbers, have wandered all over the Soudanian region, and their labors have enabled us to draw up a comparatively exact chart, to understand the climate, the resources, as well as the habits of the population.

Only one important point remains obscure, namely, the course and the source of that great river, the Schari, which throws itself into Lake Tehad. If, as it appears probable, the Schari takes its

source in those lofty mountains called "Mountains of the Moon," and which the ancients named "Backbone of the World," then the Soudan would find itself encroaching upon Southern Nigritia, for it would project beyond the equator.

It is this Soudanian region of which we are about to sketch the physiognomy and indicate the resources, as well in men as in natural products, in order to justify our project of a railroad, having as its object to unite the Soudan and the Mediterranean, and thus to open it to the commerce of the world.

#### 1.—THE SOUDAN.

The region of the Soudan is comprised between the 18th and 7th degrees of latitude north, and the 9th degree of longitude west, and the 25th longitude east of the meridian of Paris.

The Soudan is bounded on the north by the great deserts of Sahara and Lybia; on the west and southwest by the high Kong mountains, which separate it from Senegal, Senegambia and Upper Guinea; on the east by the hills of Nubia, on the other side of which runs the Nile; and on the south its limits are not decided, and it is confounded with Southern Nigritia.

The Soudan is inhabited by some hundreds of tribes belonging to the black race, with the exception, however, of the Fellain or Foulbé, who, since the commencement of this century, have conquered the country extending from Timbuctoo to that at the southwest of Lake Tchad, and the Arab or Berber tribes of Touareks, Tebbous and Utad-Sliman, who, so to speak, by turns spread themselves to the north of Lake Tchad in Bornou, Kanem and Wadai.

Geographers and travellers vary much as to the numbers of the population which inhabit the Soudan. Some carry it up to fifty, others to sixty or eighty millions. As to us, we estimate that the number cannot be less than thirty-five millions of human souls.

This human mass is still, for the greater part, delivered up to idolatry and fetichism; but in the north of the Soudan Islamism has for a long time penetrated, and was revived by the fanatical zeal of the Foulbé at the time of their conquests.

It would be wearisome to enumerate all the states which divide the Soudan, especially as nothing remains permanent there, and

as these kingdoms are born and disappear, leaving barely more trace than the ruins of the clay walls of some of their capitals.

Taken as a whole, the Soudan may be considered as an immense plateau, slightly elevated, with reference to its distance from any maritime coast. Distant, as a bird flies, about 1,200 kilometres from the ocean and about 1,500 kilometres from the Mediterranean, its average height does not exceed from 500 to 600 metres above the level of the sea.

The Soudan is traversed by chains of mountains, between which extend broad valleys, furrowed by the passage of streams with such rapid descents that sometimes it is no longer a river, but a pond, a marsh, which receives the waters falling from heaven or descending from the mountains.

But the characteristic of the Soudan is that, with the exception of the Niger, which traverses the western portion, and from thence carries its waters into the Atlantic, all the rivers of the Soudan tend to empty or do empty into a great central lake of sweet water, the Tchad, the height of which above the level of the sea is 780 feet, and which has a surface of about 36,000 square kilometres.

And moreover, the most considerable affluent of the Niger, the Bénoûé—which Barth had the glory of discovering—when it is swollen by the Faro, passes near enough to Lake Tchad, in Adamaona, to be considered as comprised in the Tchad system, and it is even probable that one could succeed without much difficulty in digging a canal in which the mingling of the waters of Tchad and the Bénoûé river would open a fluvial communication with the Atlantic.

Lake Tchad is then really the central point of the entire Soudan. Whoever wishes, either politically or commercially, to rule in Soudan, should at first secure to themselves the shores of this lake, from whence they could afterwards radiate in all directions, whether towards the upper Niger, to Timbuctoo, or to the east as far as Darfour and the celebrated copper mines of El Hofra, or towards the north to the salt mines of Bilma, general rendezvous of all the caravans of Fezzan, of Lybiennes oases, and even of the caravans coming from lower Egypt; in short, as far south as those still unexplored regions of the Mountains of the Moon. Lake Tchad is truly the heart of the Soudan.

## II.—CLIMATE OF THE SOUDAN—NATURAL PRODUCTS.

In a region so extensive as the Soudan it is understood that the climate cannot be in every part uniformly the same. But, apart from the difference which results from the altitude and position, there exist only two seasons: the season of rains, which commences generally towards the end of April and lasts until the first days of August, and the dry season, which lasts nearly nine months, from August to May. The warmest days always precede the rainy season. Thus, Barth states that at Kouka, towards the end of April, between two and three o'clock in the afternoon, the thermometer often marked 45° centigrade at the most, but never less than 39° 4' centigrade.

On the other hand, in the winter season the thermometer falls very perceptibly, so that at Kouka itself, Barth, on the 26th of November, a short time after sunrise, found it only 4° 5' centigrade. But at midday the temperature at this season is generally from 27° to 28° centigrade. Sometimes, even at night, the thermometer falls below zero.

"This considerable range of temperature," says Barth, "contrasted with the warmth of the nights in the West Indies, as well as on the coasts and in the islands of the Pacific and the Indian Ocean, is possibly caused by the too great distance of the sea, of which the heat, which is always equal, tempers the coolness of the nights. Another cause, not less important, is the fact that the cold winds from the northern regions pass freely over the uniform and arid plains which extend toward the north of the Soudan. Their elevation, it is true, is not sufficient to cause a complete change in the nature of the climate, but it is sufficiently important to occasion a general depression of the temperature, even in the neighboring countries situated more to the south."

"The average quantity of water which falls in the country of Bornou," says Barth again, "can approximate that of European countries. During the month of August alone, there fell at Kouka twelve heavy showers, giving a level of more than thirty inches of water."

In the country of Gaudio, where it rains annually during ninety days, an average of from 80 to 100 inches falls each year.

"In order to begin the agricultural labors," he adds, "they await the benediction, which falls from the clouds.

"Everywhere, then, the sun, penetrating, gives birth to the young grass and fresh verdure. The 8th of August, the sound of the drum announces the opening of agricultural labor in the estates of the sheik, situated near Kouka, and from that time we can see each day the inhabitants working in crowds to the sound of this national instrument. Scarcely a month later we had the first fruits of the new white buckwheat, but it is not until towards the end of November that they commence to bring to the market considerable quantities of this product.

"Everything buds and blossoms in this luxuriant springtime of Africa, but vegetation does not alone present this renewing of life. The animal kingdom also takes its part in all this. The last brood of birds was also covered with feathers."

Wherever water is not lacking, the ground is covered with the richest tropical vegetation. Gigantic "baobabs (*Adansonia digitata*)" grow everywhere in the endless prairies. One meets in all directions sumptuous forests of tamarinds, sycamores, banana trees, oaks, mimosas, euphorbias as large as trees, the Egyptian palm, and the "delebb," attaining a height of forty metres; the bentang (*Eriodendrum guinsensis*), the date palm, accacias more than twenty-five metres high, ebony and sandalwood trees.

They cultivate wheat, but on beds surrounded by trenches; the maize, the Indian millet, which grows to a height of more than five metres, above all, in the valleys of Kebbi; the winter corn (*kolcus cernnus*), the millet, beans, Irish and sweet potatoes, dankali, all kinds of bulbous plants, and curbitaceous plants, hemp, indigo, cotton, which is of wonderful whiteness and fineness; red pepper, onions and coriander seed.

We find here the butter tree (*Bassia Tarku*), and we gather ground almonds, the gouron or "kola" nut (*Sterculia acuminata*), also called Soudan coffee. Barth observed in several places plantations of "coffea." Rice is not cultivated, but one finds it everywhere, in a wild state, and it is gathered by the inhabitants in the forests, where the elephants compete rudely with them for it, for these animals are extremely fond of it. In the country of Bamba, and in that of Mousgou, near Katsena, tobacco plants of superior

quality are found. There is also sugar-cane, and one finds yams, "goasa" (*poa abyssinica*), and the palm-tree that yields oil (*Glacis guineensis*), in the environs of the salt-pits. One also finds everywhere banana trees, lemon trees, quick-set hedges of "rung purgans," the cicin, "Palma Christi," &c. All kinds of edible roots and an excellent fodder called "byrgou;" in certain spots figs and grapes, as in the Kanem, for instance.

Among the animals is the elephant. Barth encountered on the shores of Lake Tchad a troupe of ninety-six beasts. There are cattle, buffaloes, sheep, goats and chickens. The horses are particularly fine in Kanem, Bourgou and the country of Kano. Asses are of excellent quality. Camels and gazelles are very numerous, above all in the northern zone, near the deserts. The ostrich, the antelope "leubalis arabica," and the great antelope "addax," wild boars, woodchuck, pintados, partridges, civets, the little lapwing, the turtles, the "bombyx," or monkey.

Crocodiles, hippopotamus, rhinoceros, torpedoes, lions, giraffes, leopards, hyenas and jackals.

There are few flowers, with the exception of lilies. Swarms of birds of the richest plumage, fish, serpents and monkeys. In certain districts the fly "tse," which attacks animals, and the great ants, "termites."

The nakon, "Sesqui carbonate of natural soda," which is a great article of commerce; iron mines, pyrites of copper, gold in powder, which was formerly very common on the market-place of the ancient capital, Bornou (Ghasi-Eggono), and which is still passably so in the markets of Djuine and Timbuctoo.

Green marble, gneiss and granite are found in Gaudio, and salt in the valley of Bilma, Kanem, and that of Foghé; kingdom of Gaudio; at Boulli, in Massina; at Teghafa, where the very rich mines have been abandoned since an incursion of the Marocains. But the most beautiful crystalline salt is found at Taodeuni, valley of El Jyout, N.N.W. of Timbuctoo.

### III.—CUSTOMS OF THE SOUDANIANS—COMMERCE AND INDUSTRY.

The Soudanians, under the influence of a religion that they poorly understand, blinded by a thousand superstitions, are nevertheless

good rather than bad. They have the faults and virtues of all barbarous people. Naturally vain, they are passionate and violent, ready to make a bad use of their strength, and often to make light of human life. Nevertheless, they are quick to be mollified, easy to lead and direct, enemies of cunning, almost ignorant of treason, and in this respect they are superior to the Arabs, the Persians and the Turks. They are serviceable, hospitable and generous. Their delicacy is remarkable, and contrasts strangely with the want of honesty of the Orientals.

This portrait, traced by an eminent traveller, Escayrac de Lauture, is in all points confirmed by the other explorers who have sojourned in the Soudan, like Barth, or in Southern Nigritia, like Livingstone.

In each page of his book Barth undertakes to praise the Soudanians. He admires their gentleness, their domestic customs. "One is generally ignorant in Europe," he says, of "the excellent relations between husband and wife which exists in these countries."

The slave-trade alone—whether that stirred up by the slavers of the Niger, or that less fettered by the tribes themselves on their neighbors, at the instigation of slave merchants, who provide the harems of Egypt and Arabia, and Persia—the slave trade alone, we say, this infamous trade does not cease to degrade the black race, and in impoverishing it, brutalize it and render it ferocious.

The industries of the Soudan are very limited and inferior. Some ornaments in gold or copper, the melting of iron ore, the tanning of skins (in which perhaps the Soudanians excel), weaving, dyeing of some cotton and silk stuffs—this is almost all the art of the Soudanians and all their industry.

As to their commerce, it is affected by the indifference of the black race. If the rains have been abundant and the crops copious, the negro lives upon the fat of the land, without caring for the future. And if the remark has been made, on the one hand, that the Soudanians never leave the Soudan in a state of freedom; on the other hand, if one reflects upon the difficulties that strangers encounter in approaching Soudan, either in taking the maritime circuit which carries them to the mouth of Niger, in order from thence to ascend the interminable course of the river, or in hazarding the transit of the great deserts of Sahara and Lybia, which requires an average of from seventy to one hundred days' march, often danger-

ous and always very painful; whether it be in ascending the Nile to Kartoum, in order to penetrate from thence into Darfour, and the Wadaï, which requires, again, three or four months of travel and fatigue without end, one can easily understand the insignificance of the exterior commerce of the Soudan in proportion to its population, and to the extent and riches of the Soudanian region.

“A Prussian thaler,” says Barth, “is worth 1,300 ‘kourdis.’ At the great market of Kano, the most important of all in the Soudan, 2,500 kourdis are worth an Austrian florin or a Spanish crown. The last-named coin often serves as an ornament to the women of Goudan.”

At the market of Kouka, in average years, twenty pounds of corn only cost the number of kourdis that are equivalent to twenty-five centimes. A pound of corn is then worth a little more than a centime.\*

Food at Kouka is cheaper than in any other part of Central Africa. “It costs only half as much as at Katsena, and at Sokota it is a third cheaper than at Kano, and a quarter cheaper than at Timbuctoo.”—*Barth.*

At Kouka one can buy a good, robust horse for 25 or 30 francs. “The race of the country is very good; the horses of Bornou are not only of fine growth, but resist in an astonishing manner the fatigue to which they are inured from their very birth.”—*Barth.*

“At Kouka, a strong camel costs scarcely more than 30 francs. A butcher’s beef of six hundred pounds is sold there for a thaler and a half, about 5 francs 25 centimes. For 7 francs 50 centimes one can buy an ox or a cow, and for 3 francs 75 centimes a couple of excellent sheep.”—*Barth.*

Doctor Barth, who passed nearly six years in the Soudan and travelled through it in every direction, dragging heavy baggage with him, among which was a boat which served his companion, Owerweg, to visit the islands in Lake Tchad, and who distributed numerous presents to the chiefs of the tribes which he visited, declares, at the end of his work, that the expenses of his expedition in concert with Richardson and Owerweg, who died there, and

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\* A centime is the fifth part of a cent.

which comprised the payment of 2,000 thalers due on the preceding expedition, were not more in all than the sum of 10,000 thalers.

Although that was twenty-five years ago, since Barth returned in 1855, and allowing for the venerable immovableness of certain things in the Soudan, one can assert that, with an equal sum, one could still at this day make the same amount pay the same expenses for an equal time. An old proverb, which is current among the Tuareks, and which has not fallen into disuse, says: "One is cured of the itch by camel's dung, and of poverty by a journey to the Soudan."

On his side, the eminent and lamented Jules Duval, whose works are an authority in this matter, sums up in these terms his opinion on the subject of commerce with the Soudan: "In the Soudan, European products acquire a triple value, while, at the same time, the gold received in exchange is only counted for a third of the value which we attach to it in Europe. As to the importance of the market which they may find there, the least hypothetical calculations which have been made on the subject estimates the surface of the country represented by the northern region of Central Africa at twelve times the extent of France, the population at 36,000,000 of inhabitants, and the present commercial movement at 500,000,000 of francs."

#### EXPORTATIONS AND IMPORTATIONS.

The principal articles which the caravans go to seek in the Soudan are cotton, ivory, the "korkidan" or rhinoceros horn, very fine wool, gold powder, ostrich feathers, Soudan gum, copal gum, assafetida, paradise pepper, cardamines, ebony and sandalwood, senna, indigo, alum, native carbonate of soda, frankincense, "daou-daou," cassia-seeds, gourou, fruit of the American earthnut (peanut), &c., different essences, stuffs of blue wool, cotton cloths, leathers, vegetable silks, mats, sieves and wooden dishes.

On the other hand, the caravans carry to the Soudan cotton stuffs for garments of English make, linen cloths, fine woolen cloths, carpets from the north of Africa, woolen cloaks, "haiks of Fez," red caps, sashes of wool and silk, silk and silken tissues, velvets, tissues of wool and cotton, muslin, handkerchiefs, plain silks and

those of different colors, neckerchiefs of Tunis and Algerian silks and taffetas, corals, cut coral for necklaces and chaplets, or coarsely fashioned for ornaments, a great variety of glassware, essences, perfumes, attar of roses, cement, putty, cloves, benzine and spikenard, iron in bars, hardware, Arabian guns, German firearms, and the firearms of Belgium, England and the United States; swords and sabres; articles from Nuremberg, children's toys, mirrors, combs, finger-rings, knives, scissors, needles, sewing-thread, pumice-stone, utensils of copper and tin, and bracelets; also cocoa, sugar, curry from the East Indies, kohol, sulphur and antimony.

All this merchandise is transported on the backs of camels. For long journeys, a camel's load is 150 kilogrammes. The value of each load is, upon an average, about 2,500 francs, of which 2,000 is for merchandise and 500 francs for expenses of transport and escort.

#### NECESSITY FOR THE RAILROAD: SOUDAN-MEDITERRANEAN.

In 1788, almost in the dawn of the present century, Wilberforce founded in London the great "African Society." In order that it should coöperate efficaciously in the Christian work of the celebrated "Society for the Abolition of Slavery," the object given to it in its statutes was "the exploration of the interior of Africa."

As at this epoch it was the Americans who demanded the most slaves, the "African Association," impelled thereto by the maritime instincts of England, directed immediately its efforts towards the western coast of Africa, and particularly towards the Niger, at the time that Mungo Park had discovered the course of this magnificent stream, the sole maritime outlet of the Soudan.

At the same time, or just after, other explorers, the German Frederic Hornemann, the English Anderson, Gordon, Laing, Oudney, the brothers Lander, Clapperton, Dickson, Pearce, the Italian Belzoni, the French Rene Caillé and others still pursued the work sketched out, and almost all paid with their lives for the discoveries which have enriched African geography. But the gradual abolition of slavery in the two Americas and the Antilles caused by degrees a change of field in the explorations of the "African Association."

The Mussulman countries, Asia, Arabia, Turkey, Egypt, Tunis

and Tripoli, were the only remaining countries to demand slaves. It was then towards the north, the east and the southeast of Africa that the investigations and efforts of the "African Society" were turned.

Other travellers presented themselves in order to discover the distant and still unexplored regions of eastern and central Soudan, and they almost all died victims of their zeal for humanity and for science. Mr. Henry Duveyrier, himself an African explorer, had the pious thought to group together all these names, to save them from oblivion, and to have them engraved on a map entitled "Necrology of Africa," which has been inserted in the Bulletin of the Geographical Society, December, 1874.

But by degrees, as these exploring expeditions came to enrich geographical science with clearer ideas upon the subject of the African Continent, the zeal of the Society founded by Wilberforce felt itself excited by the conviction which was felt by all minds, of the immense advantages that the commerce and trade of Europe would derive the day when Central Africa would be opened to civilization, the day when a hundred millions of human beings would deliver the natural products of their tropical soil in return for the products manufactured by civilized nations.

Then we saw all the different governments occupy themselves with this future, endeavor to hasten it and attempt to secure to themselves the largest possible portion of the innumerable advantages that the opening of this great market would procure to those who could take part therein.

Then we saw England bend the weight of her counsel and almost of her threats to obtain from France that she should content herself with the glory of having defeated Morocco on the shores of Isly, and of having bombarded Tangiers and Mogador. Then we saw her, thanks to her immense merchant marine, secure to herself an almost exclusive preponderance in the ports of Morocco. More recently, she has exchanged with the Dutch their possession in the island of Java, in order to aggrandize her territory on the coast of Upper Guinea and plant herself more firmly at the mouths of the Niger.

Then we saw Germany slide, so to speak, into the bed that England reserved to herself, in offering her explorers, Vogel, Barth,

Owerweg, Beurmann, Petermann, to visit, almost always with the assistance of the "African Association," the tropical and equatorial countries of Soudan and Nigritia.

Then we saw France try to profit by her situation in Algeria. Mr. H. Duveyrier, in all the fire and ardor of youth, the commandant Mircher, Col. Hannoteau, and many other officers or explorers, and quite recently, at last, the unfortunate Dourneaux, Duperré and Joubert started across the Sahara to study the routes which might lead to the Soudan, and the habits of these Berber tribes, the Touareks, who guard rigorously the principal commercial marts and have constituted themselves the carriers of the desert.

Then we saw the Khedive conceive the idea of enlarging his Egyptian possessions, assist Samuel Baker and promise him the title of governor of all the provinces which he should succeed in uniting to Egypt. Col. Gordon has quite recently taken up this plan, and at the same time that the Egyptian troops seized Darfour, Gordon was able to make the examination of the White Nile. Provided with small steamboats, he ascends towards the great lakes, and the world will soon learn that the Khedive is the master of the entire course of the Nile from the sea away up to the mysterious countries of the Mountains of the Moon.

Moreover, the Khedive, in doing this, only recommences the work of the Pharaohs of ancient Egypt. Pharaohnic monoliths, in fact, have been lately found near the southeast coast of Africa and prove that the dominion of the Pharaohs formerly extended as far almost as the Zambesi. But at the same time, the Khedive, anxious to secure solid power in the regions of the Upper Nile, has hastened to call to his aid the resources of modern science. He has issued a decree for the construction of a railroad parallel to the Nile, running from Cairo to Kartoum, and he granted the first section to the English constructor Fowler. But he has wished to give it the name of the "Soudan Railroad," while in reality this line cannot and will not be any other than "The Nubian and Ethiopian Railroad."

It is not only European nations who are interested in this great question of Central Africa.

The Americans themselves, although they might appear less interested than Europe in this question, have on their side entered the

lists, and they have done so with that audacity which always and everywhere characterizes them.

Sent by the enterprising Mr. Bennett, proprietor of the New York *Herald*, Stanley was able to find Livingstone alive, and to save the manuscripts, which, without him, would have perhaps been lost forever. On his return to Europe he related what he had seen and set out soon again for a new exploring expedition and completed the work begun by the illustrious Livingstone.

In the face of such efforts, we do not hesitate to say boldly: That the period of individual explorations, or with a numerous suite, seems to us passed. The hour has come to enter resolutely the path which has succeeded so well with the Americans for a century. Railroads have, in reality, made the American Republic what it is to-day. Railways will one day make the Soudan what it should be.

Let us, then, leave the French merchants, directed by Mr. Largeau, to go on with the work commenced in 1862 by the French Government itself, and conclude with the Touareks a treaty of friendship for the free circulation of European merchandise through the oases of Sahara. So much the better if Mr. Largeau succeeds in getting merchandise coming from Europe passed through Ghadames, Rhât, and Agadés, and if the Touareks consent to escort regularly the products of the Soudan delivered to them in exchange! So much the better if Mardochée can organize towards the west, by way of the oasis of Insalah, regular relations between Timbuctoo and Algeria! So much the better if the Governor-General himself, the skilful and patriotic General Chanzy, succeeds in giving activity and life to the fairs which he has just established in the towns and oases which are situated on the borders of the desert.

The more successful these enterprises may be, the more they will cause the resources of the Soudan to be understood and appreciated. But even granting that they should succeed completely, they will still leave the Soudan at the mercy of the Touareks; they will still leave it almost completely closed to foreigners. The more the Touareks would find it for their benefit to interpose between the Soudan and Europe, and the more their demands continued to increase, the greater would be their desire to keep foreigners at a distance.

This is, therefore, not a completely satisfactory solution of the

question. It would, doubtless, be a progress ; but nothing guarantees that it would not be precarious ; quite the contrary.

The present interest of France can then cause her to accept as an advantage the good dispositions which the Touareks now display. But merchants should take the greatest care not to place entire confidence in them, while they are still able to believe themselves the true and sole masters of all communication on land between the Soudan and the African shores of the Mediterranean.

What we say about the Touareks, in reference to Algeria, we can say with greater reason of that other much less interesting tribe, the Tebbous, who hold the posts and oases of the Lybian desert, just as the Touareks hold those of Sahara. They cannot be made to behave with any decency in their mission of convoys, which they must still continue to fulfil, until the day when they are brought to recognize that they can be punished promptly and inexorably if they commit any misdeed or crime, *and above all, that in respect to the commerce of the Soudan, one can get along perfectly well without them.* We repeat it, then, emphatically : The Soudan must be opened in a permanent and, so to speak, indestructible manner, to men as well as commodities.

A railroad can alone realize this problem. Lake Tchad being the heart of the Soudan, and Europe being the most directly interested in finding in Africa the greater portion of the products which she now goes to seek in the equatorial regions of Asia and America, the railroad to be constructed should bind by the shortest possible line the Mediterranean and Lake Tchad.

It will start, therefore, from a point on the coast of Tripoli, that is to say, from the centre of the Mediterranean itself. It will be like the prolongation towards the equator of those great iron roads which, setting out from Calais and Anvers, lead to Brindisi, placing thus in direct and rapid communication with the heart of Africa, London, Paris, Brussels, Amsterdam, Frankfort, Berlin, Vienna, Trieste, Switzerland, Lyons and Marseilles, in the same manner as all these places are in communication by mail with Egypt, India and the extreme East.

“The Soudan-Mediterranean Railroad” will start from Cape Misratah and will come out near Lake Tchad, in the town of Kouka, present capital of Bornou, that country the Soudanians so justly style “the Garden of the Soudan.”

TRIPOLI AND FEZZAN.

In heaping up the great deserts of Sahara and Lybia between the Soudan and the Mediterranean shores of Africa, Nature seems to have raised an almost impassable barrier, and to have thus opposed herself to all direct connection between the Europeans and the Soudanians.

But a profound study of these countries, and still more, experience and practice, have pointed out to men certain localities, certain passages, where Nature appears to have permitted herself to yield and to have appeased her rigors.

As such appears the route followed from time immemorial by caravans across the provinces of the Ottoman Empire, Tripoli and Fezzan.

Setting out from Tripoli and passing through Sokna, Mourzouk and Bilma, in order to reach Lake Tchad, this route offers above all others the inappreciable advantage of being much the shortest and most practicable.

The total length is less than 2,500 kilometres (2,434 kilometres).

Now, the route from Tunis and Eastern Algeria (province of Constantine) traverses Ghadamis, passing through the oases of Rhât and of Agadés, to come out in the Soudan, at the capital city of Haoussa, at Kano. This route is 3,500 kilometres long.

The Western routes, either by the province of Oran or by Morocco, traverse the oases of Insallah and Mabrouk, or else follow the coasts of Morocco from Mogador and penetrate the desert by Wadi-Sakia, in the direction of the oasis Wadan ; from thence to join at Timbuctoo, and go together as far as Kano. These two routes are each almost 4,000 kilometres.

The route by Alexandria in Egypt, by the Nile to Kartoum, from thence traversing Kordofan, Darfour and Wadai, to culminate at Lake Tchad, cannot be less than 5,000 kilometres.

The route, then, from Tripoli and Fezzan to Lake Tchad, and Kouka, is shorter than any other.

It seems to us useless, after this, to speak of the water-route which leads into the Soudan by the Niger. This river, the course of which seems, so to speak, to turn its back to Europe, would compel one to make a still longer détour than that of the Nile.

But the route of Soudan by Tripoli and Fezzan is not only much the shortest. It is also the easiest and most practicable.

Taking Cape Misratah, instead of the city of Tripoli, as a point of departure, the group of mountains called "black Haroudy" and "white Haroudy" are thus a three-quarter part avoided. The greatest height to ascend only rises 624 metres, defile of "Nichka" Mount "Goudah," black Haroudy, and moreover, one can arrive at this defile by grades of 0.008, 0.009, with only slope of 0.015, for a distance of five kilometres.

And moreover, this route is, as it were, sown with numerous oases, which intersect the dreary deserts of stone and sand at intervals, the longest of which does not exceed 126 kilometres, the desert of "Tintouma."

If this route, which has remained the most frequented during all the Middle Ages as well as during antiquity, as the numerous Roman and Saracenic ruins which are met with here attest; if this route seems to be neglected in our days, it is owing in the first place to the Turks, and next to the Tebbous and Touareks, who are their neighbors to the east, the south and west of Fezzan.

The deplorable administration, and the infinite number of exactions of the Ottoman agents, have often provoked insurrections, and have always, as a consequence, turned away commerce.

One can observe, moreover, that wherever the Turk reigns, commerce soon languishes and the population decreases each year. Everything seems to die.

On another side, the Ottoman province of Fezzan has for neighbors on the east, the west and the south, two strong Berber tribes, the Tebbous and the Touareks, who, by fanaticism as much as by mercantile interest, make every effort to drive away Europeans from the route of the Soudan by Mourzouk and Bilma.

They have succeeded but too well. It is thus that the Tebbous, and, above all, the Touareks, who are organized into a sort of confederation comprising more than two hundred thousand souls, have succeeded in remaining the sole masters of the desert and the only intermediaries right of way between Soudan and Europe.

The Tebbous, in accord with the inhabitants of the oases of Augila, Syonah, Ammou, and the Great Egyptian oasis, have taken possession of the routes which lead from the Soudan across the desert

of Lybia towards Bengasi and Dernsh, ancient Cyrénaïque, and towards Moyeume and Lower Egypt, while the Touareks have become the absolute masters of the route of the Soudan by the oases of Agadés and Rhât to Ghadamis, and by Timbuctoo, the western oases of Walata, Wadan, Mabrouk, Incalah, to Morocco.

Before following step by step the line of the proposed railroad, we believe it our duty to state here some geographical, physical and commercial information on those provinces of the Ottoman Empire, Tripoli and Fezzan, which the iron road has to traverse from the north to the south, before penetrating into the region of the Soudan.

The province called Tripoli forms an "eyalet," of which Fezzan is but a subdivision.

It has a surface of about 400,000 square kilometres.

The population is only 400,000 or 500,000 for Tripoli, and from 26,000 to 30,000 souls for Fezzan.

In Tripoli, the rains generally commence in October. The months of December and January are dry. It rains again in February and in March. In the month of April, the vegetation appears in all its splendor.

Tripoli is cut by two chains of mountains almost parallel to the sea, and which form the most eastern ramifications of the Great Atlas. These mountains are called the "black" and "white Haroudy."

The "white Haroudy," which is the southernmost, is a composition of white calcareous masses. As to the "black Haroudy," perhaps its groundwork is calcareous, but it offers nothing to the eyes but basaltic peaks. It is the "Mons Ater" of the ancients.

The southern flanks of the "black Haroudy" raise abruptly their blackish crests, and are generally denuded of vegetation, while the northern slopes of the mountain are adorned with beautiful forests and verdant pasture lands.

In Tripoli one finds traces of ancient volcanic eruptions. They even say that between Tripoli and Ghadamis, in the spot where the "black Haroudy" takes the name of Mount Ghourian, the mountains contain pit-coal. The Arabs all speak of certain "black stones which burn"; possibly it may be anthracite.

Towards the southwest of the province a great bed of sandstone

often extends for some distance, and is called "Tripoli sandstone." In the province of Tripoli the climate is sufficiently healthy, but very warm.

All the valleys of the northern declivity of the "black Haroudy" are susceptible of the greatest fertility. In the Wadi-Sofedzin and Sem-Sem, there are remains of irrigating canals, coming from the Phœnicians and the Saracens, who converted certain portions of these valleys into veritable orchards.

The natural products of the country are: Cereals, cotton, madder, saffron, the seeds of the lotus, melons, grapes and fruits of all kinds; roses, vegetables, white truffles, dates (which are very highly esteemed), olives, honey and castor-oil.

Camels, horses and asses are raised here.

Numerous flocks of sheep furnish a magnificent wool. Salt is gathered in abundance from the lakes and marshes along the coast, and sulphur, which comes from the neighborhood of the gulf of "Sidre."

The divers on the coast gather sponges.

The revenue of the custom taxes in the whole province is valued at 650,000 francs a year. We speak only of that coming from Constantinople.

The city of Tripoli, the "Ola" of the ancients, possesses a small but safe port. "All the surrounding country is nothing but a magnificent garden."—*Barth.*

The population is about 30,000 souls. Capital, the "eyalet;" it is the residence of a Governor, having the rank of pasha.

Its exports scarcely rise to six or seven millions of francs a year. The importations appear to be a third larger.

The commerce of Bengari, in the west of Cyrénaïque, at present called "Barca," is about half that of Tripoli.

Meanwhile, Tripoli is at present the only town of any importance in the direct commerce of the Soudan. Formerly, Tunis, Algiers and Oran partook of this advantage. But, for different causes, these three cities, although the two first have become much more important, since Tunis possesses to-day a hundred thousand inhabitants, have completely ceased to maintain regular commercial relations with Central Africa.

We must then suppose that it is towards Egypt, and above all towards Morocco, that almost all the merchandise which enters or

goes out of the Soudan flows, since, according to Jules Duval, the Soudanian commerce rises to nearly 500,000 francs a year.

This merchandise has to bear journeys of from four to five thousand kilometres, at an average price of from 0.25 to 0.30 centimes a ton and per kilometre.

From Tripoli the caravans now, for the most part, travel in the direction of Ghadamis, where the Touareks undertake to escort them to Kouka, Kano and Timbuctoo.

To the east of Tripoli there was formerly a celebrated city called "Leptis Magna." It is to-day a small borough named Lebdah. Fine Roman remains are to be admired there, but its antique port is destroyed.

Not far from Lebdah is Wadi Kaam, the "Cynips" of the ancients. The cultivation of this valley, formerly so renowned, "has given place to a vast extent of solitude and desolation. Extremely interesting vestiges of a grand system of dykes which had been established by the ancients are found here."—*Barth*.

Fezzan is like a southern prolongation of Tripoli. It is composed of a succession of very fertile oases, separated by portions of deserts, composed of pebbles and sand.

Salt abounds there, for the entire country is, so to speak, nothing but one great salt marsh. Five lakes of natural carbonate of soda can be counted. One alone of these lakes, the Trona, is leased out at 11,500 francs a year. It yields annually seven thousand quintals\* of naphtha.

Thus, the "Soudan-Mediterranean" railroad, while having as a principal terminus the commercial market of the Soudan, must, before arriving at the Soudanian region, pass through a territory which already furnishes important resources, and which only needs the labor and energy of man to become still more fertile and productive.

The energy can only come from civilized nations. It will come both from Europe and America.

The labor will be principally furnished by the Soudanians.

It is with human races as with princely races. The sea always attracts them. The present imperial house of Hohenzollern had the mountains of German Switzerland for a cradle. From migration to migration, it at last arrived on the borders of the Baltic, where it hastened to erect a castle and found the city Koenigsberg.

\* One quintal is a hundred pounds weight.

It had then engraved on its escutcheon this device, which, in its brevity and conciseness, includes the whole history of its princes for many centuries, "From the rock to the sea."

Thus also acted the Czar of Russia when he abandoned Moscow, the holy city, and came to found St. Petersburg. Thus also did the Tartars, when they invaded China "with its hundred ports." And thus all people.

In like manner have the blacks of Central Africa descended to the mouths of the Congo, of the Ogowai and of the Niger, and have peopled the maritime territory to the two Guineas, of Senegambia and Senegal.

And they would have done likewise all along the course of the Zambesi, on the maritime coast of the Straits of Madagascar, had it not been for the Arabs.

But these semi-barbarians were forced to recede from the coast of the Atlantic before the still more barbarous proceedings of the civilized nations, so well imitated and continued to this day (on that long sea coast which starts from the Red sea and ends at the country of Natal) by the Arabs who traffic in human flesh.

With the Soudan-Mediterranean Railroad another and more Christian and more fruitful policy will penetrate into the heart of Africa. And we shall then see at the same time that a portion of the great surplus of European population will come and colonize the shore of Tripoli, and the surplus of the Soudanian population will come from its side and people first the oases of Fezzan, then ascend insensibly towards the north until they reach those shores bathed by the blue waters of the Mediterranean.

The blacks will find in Fezzan and Tripoli nearly the same warmth of their native country. In summer the thermometer in Fezzan often rises to 45° centigrade, and in Tripoli 39° to 40°.

But the rains are insufficient in the region of Fezzan, and the want of water is often felt there. Modern science will teach the Fezzanians, as it has taught the blacks, the means of improving the culture, enlarging and enriching the oases by the digging of artesian wells. With water, the grass will first appear, then plants fit for fodder, then trees. The dew will be more abundant, and the soil become more fertile, the harvests more copious, as it has occurred in lower Egypt, in part irrigated and rewooded by the intelligent care of the Khedive.

The Soudan-Mediterranean Railroad will assuredly give an impulse

to all these progresses, and will realize the following dream that two Central African explorers counted upon seeing accomplished by the navigation of the Niger:

"Then one hundred million men would be placed in direct contact with our arts and our civilization; new and immense markets would open for the products and needs of our manufactories and our industry. A virgin land would yield to the investigations of our arts and our sciences the treasures of its mysterious and inexhaustible fruitfulness. A hundred nations, awakened from a long lethargy, would, like so many active and useful members, unite themselves to the great republic of the human race.

LINE OF THE SOUDAN RAILROAD.

Point of Departure.—Cape Misratah, 3 metres above the level of the sea.

Terminus.—Kouka ; town near Lake Tchad, 276 metres above the level of the sea.

Highest Point.—Col Nischka, Mont-Soudah, 624 metres above the level of the sea.

Ordinary Grades.—0.006 ; 0.007 ; 0.008 ; 0.009.

Highest Grade.—0.015 ; twice, and for a distance of 5 kilometres only.

There are 11 sections, and there are 58 stations.

1.—CAPE MISRATAH, OR CEFALO.

Calcareous coast ; a few metres only above the level of the sea. Bay well sheltered from the west and northwest winds ; it is called "Marsa Boucheifa" ; it is clear ; has a depth of 5, 8, 9, to 11 metres.

*Town of Misratah*, at 5 kilometres from the sea.—Residence of an Agha governor of the district. In the environs are palm, olive and fig trees ; culture of grain. Carpet factory. Excellent wools. Tissues of light stuffs. Necklaces for the negresses of the Soudan.

2. *Caourga, Bourough*.—Fabrication of good carpets.

3. *Valley Sofedin*.—Slate forms the subsoil of the valley ; gypsum on the plateau. This valley is very remarkable ; it is the largest of all those which descend from Mount Ghourian. Its total length exceeds 200 kilometres. Vestiges of ancient cultivation are found

here, and this valley seems naturally worthy of a better fate than that to which it is reduced. It constitutes the most fertile portion of the regency of Tripoli. It is inhabited by the Goutara and Ulad-Bou-Sef tribes. In ascending the valley, we find at its extremity the village of Miska, the inhabitants of which possess essentially the mercantile spirit. They are benevolent and hospitable, and enjoy a great reputation for probity. Everything is safe with them, and the camels go to pasture, without guards, in a blooming valley from four to five miles distant.—*Barth.*

4. *Sensem Valley* is one of the most celebrated valleys of Northern Africa. The mountain which encloses it towards the south is composed of layers of marl and gypsum, abundantly mixed with fossil shells.

5. *Boudjem*.—A small town, containing the remains of a Roman citadel of the time of Septimus Severus.

9. *Sokna*.—A well-built town, surrounded by walls. 2,500 souls; Arabs Riaks. Neighborhood well supplied with date-trees, yielding superior fruit. Branching-off place for caravans going to Bengasi (Cyrénaïque), and to the oases of Angila and Syouah (Ammou), *en route* to Cairo and Alexandria, in Egypt.

“This town is a very important one, as well for its commercial activity as for the character of its inhabitants.”—*Barth.*

18. *Sebha*.—Principal town of the district. Southern limit of apricots and peach trees.

24. *Mourzourk*. Capital of Fezzan.—Two to three hundred inhabitants, including 400 garrison men. Very thick walls. Vast esplanade, “dendal,” like those of the Soudan cities. Bazaar and *Kasbak*. Almost all the taxes proceed from the slave trade.

30. *Tejerri*.—A small town, surrounded by high walls of clay.

33. *The Well Mescherou*.—Celebrated for the innumerable bones of dead slaves by which it is surrounded.

35. *Oasis of El War*.—Narrow and sinuous valley; sandhills.

38. *Oasis of El Ahmar*.—Abundantly provided with colycinths, and all kinds of plants that grow in this region. Bounded on the northwest by a group of high mountains. Large herds of gazelles. No wild beasts.

39, 40. *Oasis Maffaras*.—Continuous plantations. Dr. Vogel has carefully determined by his astronomical observations the situation of the “*puit nord Mafferas*.”

41. *Oasis Dyehala, or Yat*.—Valley full of plantations. Fifteen miles further south is another very rich and verdant valley.

42. *Oasis Siggedim*.—Abundance of Egyptian and flabelliform palm-trees, date-trees. Besides, the soil, although covered with a layer of salt of certain spots, produces in great quantities a highly esteemed herb called "sebot."

43. *Oasis Iggeba*.—A ravine covered with grass, as well as by a great number of Egyptian palm-trees, and possessing an excellent spring of fresh water.

44. *Oasis Anay*.—The northernmost locality of the valley of Kaouar. The caravans here lay in a provision of forage.

46. *Aschenoumu*.—About a hundred huts on a terrace. In the valley below is a little grove of palm-trees, surrounded by isolated groups of grey sandstone, at the foot of which they draw water from broad excavations, situated scarcely a foot below the surface.

47. *Babous, or Dirkî*.—A grove of very beautiful palm-trees; village of miserable aspect, which has, nevertheless, a certain importance. Two other hamlets to the left of the route.

48. *Eggir*, Borough.—Narrow valley; palm grove. All kinds of plants easily cultivated by means of wells, "a traction." The soil itself produces "l'aghoul" (*hedyssarium Alhadji*), and "molouchia" (*corchorus olitorius*). The valley, called by the Arabs "Kaouar," is very interesting. Beautiful groups of palm-trees, verdant soil, covered with little gardens planted with vegetables and "ghedeb" (*melilotus*).

49. *Bilma*, situated in the midst of a beautiful grove of palm-trees.

"The beds of salt are a few steps from the town, and form little regular basins from 12 to 15 feet in diameter. It is in these basins that accumulate the water of the environs, saturated with salt, which they collect and evaporate in clay moulds."

"Abrupt summits of rock form here and there picturesque terraces.

"The valley is thickly wooded."—*Barth*.

50. *Saukoura*.—This valley, where springs are found a few feet below the soil, offers an agreeable aspect, all the fountains being adorned with groups of palm-trees.

"The length of this oasis is fifteen hours' march, and terminates at the well, 'Mouskatenou,' a kind of shallow hole full of marl and alum."—*Barth*.

51. *Dibbela*.—*Barth* was struck with "the romantic character of

this country, so full of wild enchantment." All around Dibbela rise high sand-hills, overtopped by black masses of rock, and intersected by deep valleys, dotted with isolated Egyptian palms. The spring-water is detestable on account of mineral alkali with which it is saturated.

53. *Agadem*.—The valley of Agadem produces in abundance, bushes of "siwak" (*capparis sodata*). In the desert one finds quantities of these sandy crystallizations, which the aborigines call "earth-shoots," and the origin of which is not known. *Desert de Tintouma*.

54. *Bedouaram*.—Wells; desert all around.

"Before arriving at Koufe, there are beautiful valleys, appropriate for the pasturage of camels and sheep."—*Barth*.

55. *Koufe*.—Wells. The country infested by hordes of Tebbous and Touareks.

56. *Nyegimi-nuova*.—The old town having been submerged by the waters of the Tchad, the inhabitants retired to the surrounding heights, and have remained fixed there.

At Ngegimi, the women sell milk, butter, chickens and both fresh and salt fish. They prefer to receive in payment corn and glass-ware. Two miles from Ngegimi is the valley of Kibbo, remarkable for the abundance of its springs. It is besides the northern limit of the white ants.

57. *Barrona*.—Celebrated for the preparation of dried fish. In the environs are superb parks of cattle.

58. *Yo*.—Village on the banks of the river Waoubé. Magnificent tamarinds, in the shade of which cotton and corn are cultivated. "Fine prairies and parks for the breeding of domestic animals lie on the western shores of the Waoubé. The ruins of the famous city of Ghambarou, special and favorite residence of the kings of Bornou, at the time of the splendor of the kingdom."

"All this beautiful country, wild to-day, formerly couped hundreds of cities and villages, and formed by its industry and cultivation the garden of Bornou. The city of Ghambarou was destroyed in 1819 by the Foulbé."—*Barth*.

At the present day we still find plantations of cotton, little villages, numerous flocks of sheep, ostriches and gazelles.

*Kouka* is the present capital of Bornou, and has 30,000 inhabitants. There is a market every day. After Kano, it is the most important commercial city of the Soudan.

### RECAPITULATION.

Point of Departure : Cape Misratah, 3 metres above the level of the sea.

Terminus : Koûka, town near Cape Tsâd, 276 metres above the level of the sea.

Summit : Nischka Peak, Mount Soudah, 624 metres above the level of the sea.

Ordinary Grade : 0.006 ; 0.007 ; 0.008 ; 0.009.

Maximum Grade : 0.015—occurring twice within 5 kilometres only.

### PROFILE.

11 sections.

58 stations, towns, townships, wells, oasis.

### SECTIONS.

I.	From the sea to Boudjem...	227	kilometres.	} 2,434 kilometres, or 1,314 English miles (60 to a degree); or 329 German miles (15 to a degree); or 548 Leagues (25 to a de- gree).
II.	" Bondjem to Sokna....	175	"	
III.	" Sokna to Sighen.....	203	"	
IV.	" Sighen to Mourzourk..	214	"	
V.	" Mourzourk to Tejerri..	238	"	
VI.	" Tejerri to El Ahmar..	292	"	
VII.	" El Ahmar to Siggedim.	206	"	
VIII.	" Siggedim to Bilma....	206	"	
IX.	" Bilma to Agadem....	226	"	
X.	" Agadem to Koufe....	204	"	
XI.	" Koufe to Koûka.....	243	"	

### STATIONS.

#### FIRST SECTION.

1	From Cape Misratah to Tasourga—township..	46	kil.	} 227
2	" Tasourga to Vallée Sofedjin—well.....	11	"	
3	" P. Sofedjin to Vallée Semsem—well....	68	"	
4	" P. Semsem to Vallée Bel—well.....	42	"	
5	" P. Bel to Boudjem—town.....	60	"	

## SECOND SECTION.

6	From Boudjem to Vallée Bounaschi—well....	39	"	175
7	" P. Bounaschi to Tar—well.....	112	"	
8	" P. Tar to Sokna—town.....	24	"	

## THIRD SECTION.

9	" Sokna to Godfah—well.....	28	"	203
10	" P. Godfah to Vallée Temeschin—well.	54	"	
11	" P. Temeschin to Gerenfad—well.....	65	"	
12	" P. Gerenfad to Sala-El-Sultan—well...	5	"	
13	" P. Sala-El-Sultan to Om-El-Abib—well	31	"	
14	" P. Om-El-Abib to Sighen—town.....	20	"	

## FOURTH SECTION.

15	" Sighen to Gourmeda—well .....	25	"	214
16	" P. Gourmeda to Taghetah—well.....	5	"	
17	" P. Taghetah to Sebha—township.....	33	"	
18	" Sebha to Sidi-Mousseroud-Lamin—well.	32	"	
19	" P. Sidi-Mousseroud to Wischki—well..	29	"	
20	" P. Wischki to Ghodoa—oasis.....	7	"	
21	" Oasis Ghodoa to Vallée Nimmel—well..	31	"	
22	" V. Nimmel to Delem—township.....	30	"	
23	" Delem to Mourzourk—Capital of Fezzen.	22	"	

## FIFTH SECTION.

24	" Mourzourk to Mestouta—well.....	97	kil.	238
25	" P. Mestouta to Gatoon—township.....	91	"	
26	" Gatoon to Daschi—well.....	12	"	
27	" P. Baschi to Madroussa—township.....	11	"	
28	" Madroussa to Karasaoua—well.....	21	"	
29	" Karasaoua to Tejerrı—township.....	26	"	

## SIXTH SECTION.

30	From Tejerri to Omah—well.....	14	"	292
31	" P. Omah to Ghad—well.....	15	"	
32	" P. Ghad to Mescheron—well.....	47	"	
33	" P. Mescheron to May-Yava—well.....	26	"	
34	" P. May-Yava to El-War—oasis .....	95	"	
35	" O. El-War to El-Bab—well.....	38	"	
36	" P. El-Bab to El-Garha—well.....	39	"	
37	" El-Garha to El-Ahmar—oasis.....	18	"	

## SEVENTH SECTION.

38	" Oasis El-Ahmar to Maffaras—north well.	75	"	206
39	" P. Maffaras to Oasis Maffaras.....	15	"	
40	" Oasis Maffaras to Djehaza ou Zat—oasis	76	"	
41	" Oasis Zat to Siggedim—township.....	40	"	

## EIGHTH SECTION.

42	" Siggedim to Tggeba—oasis.....	60	"	206
43	" Tggeba to Anay—township.....	67	"	
44	" Anay to Kebbi—township .....	12	"	
45	" Kebbi to Aschenouma—oasis.....	12	"	
46	" Aschenouma to Babous ou Dirki—oasis..	22	"	
47	" Babous to Eggir—village and oasis.....	14	"	
48	" Eggir to Bilma—township and oasis....	19	"	

## NINTH SECTION.

49	" Bilma to Sasukoura—oasis.....	54	"	226
50	" Sasukoura to Dibbela—oasis.....	87	"	
51	" Dibbela to Kasama-forma—well .....	61	"	
52	" Kasama-forma to Agadem—township....	24	"	

## TENTH SECTION.

53	" Agadem to Bedouaram—well, Desert of Tintouma.....	126	"	224
54	" Bedouaram to Koufe—well.....	78	"	

## ELEVENTH SECTION.

55	" Koufe to Ngegimi—township.... ..	67	"	243
56	" Ngegimi to Barroua—township.....	71	"	
57	" Barroua to Yo—town on the river Wasubé	38	"	
58	" Yo to Kouka—Capital of Bornou.....	67	"	

## NORTHWEST AFRICA AND TIMBUCTOO.

BY

FELIX A. MATHEWS, UNITED STATES CONSUL-GENERAL AT MOROCCO.

### PART I.

#### SUS, WADNOON, THE SAHARA.

That part of the western coast of Africa which lies between the latitudes of 20 and 32 degrees north, has been differently laid down in various charts, but perhaps never yet accurately, excepting the portion of coast from latitude 28° to 39° 30' reconnoitred and surveyed by the commission on board the Spanish man-of-war *Blasco de Garay*, in 1878. The Spaniards, who fish on this coast eastward of the Canary islands, assure us that soundings are to be found quite across to the continent, and there is a tradition among the Arabs, that in very remote ages those islands formed part of the African continent. In support of this tradition, it may be observed that the aborigines of Lanzarote resemble in manners, in physiognomy, and in person the Africans of the Atlas, and retain some of their customs; and there is no doubt that the geological formation and vegetation of the Canary islands is the same as that of the Atlas mountains nearest to the Atlantic. North and south of the promontories of Gher and Noor the Atlas submerges into the Atlantic ocean, its crest rising again at no great distance from the coast, forming the group known as the Canaries, Lanzarote being one of said group.

That portion of the coast which lies between the above-mentioned latitudes is a desert country interspersed with immense hills of loose sand, which are from time to time driven by the wind into various forms, and so impregnate the air with sand for many miles out at sea as to give to the atmosphere an appearance of hazy weather. Navigators not aware of this circumstance never suspect during such appearances that they are near land until they discover the breakers on the coast, which is so extremely flat in most places, that one may walk a mile into the sea without being over the knees, so

that ships strike when at a very considerable distance from the beach. This shallowness is caused by the continual drift of the desert sands toward the sea. Added to this, there is a current setting in from the west toward Africa with unconceivable force, which has been the cause of numerous wrecks, many of which have never been known. The plundering Arabs, after taking everything portable from the vessel if the sea does not wash it to pieces, set fire to it in order that it may not serve as a warning to other ships which may be so unfortunate as to follow the same course. In such instances the crews have been made captives and either redeemed or sold in the interior.

The coast of Wadnoon extends a long way to the southward, nearly as far as Cape Bogador. The river Akassa, which often erroneously has been called in the maps the river Nun, and in some Daradas, is a large stream from the sea to the town of Nun, which is about fifteen miles inland and about two miles in circumference. From hence the river becomes shallow and narrow. It is to the southward of this river that the ships have been wrecked. Between Akassa and the province of Ait Bainaran, in Sus, is a peninsula extending into the ocean, resembling that on which Mogador is built, where are the remains of a fort erected by the Spaniards, but evacuated by them at the time they discovered America. They and the Portuguese, severally, afterward endeavored to obtain possession of it for the purpose of establishing a commercial factory, but the natives objected to the proposal, which probably was not made by the Government but only by some speculating individuals. Several attempts have been made by the Spaniards to establish themselves in this coast, and at the conclusion of the last war between Spain and Morocco, the so-called port of Santa Cruz de mar Pequena was ceded by Morocco to Spain, notwithstanding that the Sultan of Morocco has not even a nominal power over this country. In 1878, the Spanish Government steamer *Blasco de Garay*, left the Canaries for the adjacent coast in search of Santa Cruz de mar Pequena, but nothing was done, and since Mr. Mackenzie's operations have taken place.

This territory, which lies between Morocco and Timbuctoo (a portion of its coast I have briefly described), is divided into several sections or Kabies, which are governed by various independent chiefs or sheiks, commonly called Ait-el-arbein (the people of the Forty),

meaning the number of chiefs who rule them. The principal among these chiefs is Sheik El-Houssain Ben Hisham, who possesses great influence in the councils of chiefs on account of his descent from an old imperial family, and also on account of the central territorial position which his tribe occupies. He therefore disposes of most matters in connection with trade of the country, and its relations with the adjacent territories on either side of Wadnoon is generally looked up to by all tribes, many of which are more numerous and even more powerful than his.

The population of this country is naturally peaceful, though often called into strife, either with their neighbors or other marauding tribes whose object is chiefly plunder.

Their religion is Mohammedan, and their chief pursuits are agriculture, cattle, farming and commerce.

The soil is naturally fertile and its great mineral riches are still unexplored, except by some few Talebs who, by the aid of small crucibles and plain chemical substances, manage to purify the loose surface ores and bring to market small quantities of gold, silver and copper. It is the specimens of ores which were a while ago sent to London which encouraged British traders to try to make a settlement in the neighborhood.

The trade of the country is mostly done at markets which take place in different districts once a month, between March and October, which markets or fairs are called "almugars" and generally bear the name of the patron saint of the district wherein they are held.

Through its geographically central position, Wadnoon is the half-way house for Morocco traders, who flock there during the seasons of the fairs for the purpose of meeting the "acabahrs" or caravans which come from the Soudan district and Timbuctoo, all of which go no further than Wadnoon, where they do their bartering on a large scale.

These caravans of 1,000 to 10,000 men each generally bring with them gold in small bars, in dust and in ornaments or trinkets (mostly taken from the dead and prisoners in the numerous encounters which are constantly taking place between the negro tribes about Sahara), ivory, ambergris, ostrich feathers, skins of wild animals and dromedaries. Besides this, they also bring a large number of

slaves of all ages and sexes, which are either sold or bartered with the Morocco traders, who, on the other hand, bring into the market sugar, tea, iron in bars, arms, sulphur, saltpetre, cotton goods of all classes and chiefly blue salampores and baft (dyed cottons). These articles form the staple trade carried on between the caravans which come from both sides to meet at Wadnoon; but in addition to these the country itself produces in abundance almonds, gums of various classes, ostrich feathers, ambergris; also gold, silver and copper, wool, cattle and grain, all of which, excepting the last two articles, are bought or bartered by the Morocco traders and taken to Mogador for sale.

In former times there existed a kind of treaty between the Sultan of Morocco and the Wadnoon chiefs, who were his tributaries, paying him an annual tribute, for which they received in exchange grants of free houses for residence and stores for their goods, as well as exemption of export duties on parcels of goods which belonged to the sheiks.

Since the imprisonment and captivity of Mr. Butler, the Sultan broke faith with these sorts of republics and imprisoned some of the men they sent to transact their business, upon which they also ceased or reduced direct intercourse with his country, and the tributes formerly paid are now reduced to two slaves, which Sheik-el-Houssain sends yearly to the Sultan for the sake of keeping up their correspondence as friends and kinsmen. But while Morocco continued in its retrograde course of action, the independent sheiks of Wadnoon persevered in their good faith and principles by encouraging the traders of Morocco that came to their country and allowed them to traffic unmolested, notwithstanding the ill-usage inflicted by the Sultan of Morocco upon the men from Wadnoon.

The most extraordinary feature which characterizes the "socks" fairs is that many men from different tribes and districts who happen to come are often on a footing of animosity and even have family blood to revenge, but so much respect is paid to the interest of commerce that men who meet their enemies at the fair or on the way to and from it, are neither molested nor allowed to molest until the fair is over.

Unfortunately for Morocco, its system of government has lost this mainspring of its commerce, as, owing to the unsafety of the

roads leading through Morocco, very few if any merchants venture to go through Haha or Intuga, two provinces famous for their lawlessness and misgovernment, the Governors of which not only tolerate highway robbery and pillage of travellers, but even go so far as to participate in the spoil; in fact, many gangs of robbers are known to be the Governors' own men. By these means trade with Wadnoon and even with the Sus district has been crippled, and Mogador merchants have lost not only the principal outlet for their imports from Europe, but also the source whence they derived the richest produce for export.

The Wadnoon people, ever active and intelligent, have seen their trade gradually falling off and lost, have spared no opportunity to create other connections for developing the resources of their country, and therefore hailed with joy the arrival of some Spanish fishing smacks, which now and then visited their coast. Negotiations were opened with the Canary islands as early as 1859, which, however, were of short duration owing to the bad faith of the Spanish coasters, who took advantage of the confidence placed in them by the Wadnoon people, and left without paying for the sample cargoes they took, and in cases where barter was made, the goods delivered were never up to the mark of samples that were shown. This unfortunately created a bad impression on a race of people whose habits and customs compel them to give and take implicit confidence, but this once shaken, they have become very chary in their dealing with Europeans, though never ceasing to court the latter's connection.

Many reconnoitering voyages have been made by Spanish, French and English vessels, but nothing of a serious nature was ever concluded as to future commercial relationship, except the assurance repeatedly given by the natives that they would gladly welcome any trading community which would come in good faith to establish commercial relations.

The Sultan of Morocco, instead of correcting the evils which bring about so much misery to this rich, but most unfortunate and misgoverned country, by adopting stringent measures and laws and punishing malefactors, endeavors to put every obstacle in the way of progress of the neighboring republics, and for that purpose adopts the infallible mode of influencing all Mohammedans by in-

enting, through large tribes, some of the fanatical heads of the Musulman Church to preach the holy war against all whosoever encourages relations with Christians. Although this means has, to some extent, obstructed the path of negotiations in many instances, it has, nevertheless, not checked the enterprising Mr. Mackenzie, an English engineer, who visited this coast as early as 1872, in company with a shipowner named Campbell. They travelled through the whole country, gleaning information as they went along, and no doubt this journey gave birth to Mr. Mackenzie's enterprise in 1878.

Mr. Mackenzie very wisely selected a deserted part of the coast, far from every inhabited district and offering a safe landing. Here he established correspondence with two sheiks, who, though very poor, yet possess some influence over a certain portion of the population. These two men, who are Mr. Mackenzie's pensioners, have procured him sample cargoes of wool, gums and other produce at very high prices, which Mr. Mackenzie took, either through inexperience as to the intrinsic value of the goods or in order to entice further operations on a large scale by giving good value for the first lots.

From all we know, Mr. Mackenzie has no experience as to the value of goods, and it is believed the trade he does is pursued more as a cloak to his real intention to be the first to establish a British settlement in that part of Africa for the introduction of British manufactures.

Some three hundred operatives were brought from the Canaries in June, 1880, for the purpose of building houses and fortifying the place. Meanwhile his trade has been transacted on board a hulk anchored at a small distance from the shore, which serves the purpose of store as well as residence for the men. The hulk is armed with four Gatling guns, besides small arms. The steamers that call there landed and took their cargoes on this hulk.

The Sultan of Morocco made several futile attempts to frustrate the purposes of the English company, but through its perseverance and also through the scarcity of fanatical influence, which is the Sultan's most efficient means, the company has carried on its work unmolested for some time. In the early part of 1880 some English merchants of Mogador opened a correspondence with the sheiks of Wadnoon, who deputed five of their number to treat

with the Englishmen. An active overland correspondence ensued about terms of monopoly and other details until May, when an unexpected event rendered it impracticable to carry out their object.

A London firm, connecting itself with three houses at Marseilles, started an African expedition, and having chartered the steamer *Anjou*, they loaded her with sugar, tea, cotton goods, provisions, timber, sulphur, gunpowder and arms.

Three of the merchants sailed by her for the Canary Islands, whence they were to take some experienced men who had been sent from Mogador for the purpose of assisting in the negotiations. It just happened that one of these men was beforehand employed by the English traders who had been in correspondence with the sheiks, and having acted as a spy on his new employers, betrayed all their movements to the merchants at Mogador, and these quietly informed the Sultan's authorities of the project on foot. The Sultan, never backward in any movement whereby his perfidious intentions may be furthered, sent the Sheik El-Houssain a large sum of money, saying it was as indemnity for robberies of the sheik's property committed on the Sultan's territory, asking the sheik at the same time to oppose the landing of the *Anjou*'s expedition.

Thus it was that, by the time the *Anjou* had reached Sffuy, a small creek on the coast of Ait-Ba-Auran, they found the beach swarming with armed men from all tribes, all of whom made the convened signals for the people to land; this, however, they would not do, but sent one of the employes to reconnoitre and report, and on his return he said that several chiefs invited them to come on shore and treat with them, but Sheik El-Houssain was not there. Upon this, a courier was despatched to the sheik, who declined to encourage any enterprise whereby his kinsman and neighbouring sovereign would be prejudiced. The reply brought about a serious dispute between the partisans of the various sheiks, finishing up by a broil at arms, which at once decided the *Anjou* to put off for Mogador, where part of her cargo was landed, the sulphur, powder and arms being carried back to Marseilles.

At the same time the Sultan circulated the rumor of his intention to open the port of Agadir at the extreme south of his coast, which

rumor, like those of all the Sultan's good intentions, proved to be a *canard*.

Since the failure of the *Anjou's* expedition, the Sultan of Morocco has unceasingly kept up the fermentation at Wadnoon, and eventually succeeded in getting some malefactors to set on fire the wooden buildings which Mr. Mackenzie had on the shores of Cape Juby, and this occurrence having been the cause of ceasing communication, Mr. Mackenzie went to England, and his representatives decline to traffic with the natives (who have brought to the spot quantities of wool and other produce) until his return, which is daily expected.

At present Mr. Mackenzie's men are busily engaged building a pier for facilitating the landing and embarking of goods, and sheltering vessels against the breakers; and it is supposed that, in spite of the Sultan's behests, England tacitly encourages the establishment of English settlers on the coast of Africa.

There is little doubt but that the establishment of direct relations with the coast of Wadnoon would tend materially to benefit all concerned, as the Sultan's influence there cannot last much longer. The agitation caused by the influence he brings to bear upon the fanatical portion of the natives will gradually subside, in the presence of his failing to carry out the reforms and improvements in his dominions, the promises of which were the principal temptation held out to those who carried out his desires, but who must now be undeceived as to who deserves more of their confidence, whether the Europeans who came to settle there for the benefit of the country, or a Sultan whose perfidy has proved more than once a source of great loss to themselves.

The more sensible among the sheiks are now doing their utmost to bring new settlers into their territories, and we hear that Sheik El-Houssain has erected some three hundred shops for Jewish traders who come from Morocco to attend the fairs (or socks).

Others are in regular communication with English, French and Spanish firms, endeavoring to establish firm and lasting connections, but so far have not met with any, except Mackenzie, who would carry out their desires.

The position taken by Mackenzie in the extreme south of the Wadnoon coast leaves room for other settlements along the coast

nearer to the more populated part of the territories with which trade could be opened forthwith, and the chiefs, we know, have gone so far as to conclude treaties of commerce and give hostages as to the fulfillment of their part of compacts.

It will be necessary for merchants of any nation that may wish to open the trade to have the approval and support of their Government in order to offer the natives such substantial guarantees as they justly require, and also that in case of any attacks from Morocco they may find a nation that would exert its influence in their favor.

Having just mentioned the Sultan's feigned rumor of opening the port of Agadir, it will not be out of place to describe *en passant* this port and the coast southerly to Wadnoon. Agadir, or Santa Cruz, called in the time of Leo Africanus, Guertguessem, is the last port in the Emperor's dominions. The town, which stands on the summit of the mountain, is strong by nature, and its walls are defended by obsolete batteries. The principal one is at a short distance from the town, down the mountain, and was originally intended to protect a fine spring of water close to the sea; this battery also commands the approach to the town both from the north and south, and also the bay. The town called by the Portuguese Fonti is still standing at the foot of the mountain, and the arms of that nation are still to be seen in a building erected over the spring.

Agadir, or Santa Cruz, was walled around and strengthened by batteries in 1503 by Emanuel, King of Portugal, but it was taken from the Portuguese by the Moors in 1536.

The Bay of Agadir is probably the best road for vessels in the empire, being large and well defended on every side from all winds. It abounds in fish.

In the reign of Mulay Ismael, Agadir was the centre of a very extensive commerce, whither the Arabs of the desert of Sahara and the people of Soudan resorted to purchase various kinds of merchandise for the markets of the interior of Africa. It was called bab-el-Soudan (gate of Soudan), and caravans were constantly passing to and from Timbuctoo. The natural strength of the place, its imposing situation, the wealth of its inhabitants, excited the jealousy of the Emperors, which was confirmed in 1773 by the inhabitants becoming refractory, and Taleb Solh, the Governor,

refusing to deliver it up. On learning this, the Sultan, Sid Mohamed, marched with an army from Morocco against it. The place did not make a long resistance, for the rebellious Governor yielded to the persuasions of the chiefs to accept the Sultan's offer of pardon upon yielding his allegiance.

He accordingly repaired to Tamaraet, the Emperor's headquarters, and was immediately imprisoned ; but procuring, through a friend, a penknife baked in a loaf of bread, he committed suicide.

The town having surrendered, the merchants were allowed a short time to collect their effects and proceed to Mogador, where the Emperor encouraged them to build houses and carry on their trade. Since then the most important port of Morocco has been closed to all foreign trade.

Beyond Agadir there is no port frequented by shipping ; there is a tract of coast, however, which holds out great encouragement to commercial enterprise, and secure establishments might, with tact, be effected upon it, amply remunerating the enterprising speculators.

The people of Sus are also well disposed towards Europeans, and the communication and short distance between this place and the province or districts where most of the valuable products of Barbary are raised and foreign manufactures consumed, render it peculiarly more adapted to trade than any other port of Morocco. Agadir is twenty-one miles south of Cape Gher, in latitude  $30^{\circ} 35'$ .

From Agadir, southward, the sovereignty of the Sultan of Morocco slackens. The tribes, like so many republics choosing their chiefs, and the difficulty of passing an army over that branch of the Atlas which separates Sus from Haha, secures to these tribes their arrogated independence.

There are but two roads fit for shipping between Agadir and Cape Bogador, an extent of coast, for the most part desert, of nearly two hundred and fifty miles, the whole of which is inhabited by the various tribes of Arabs who have emigrated at different periods from the interior of Sahara, and pitched their tents wherever they could find a spot capable of affording pasture to their flocks. All along this most dangerous and deceitful coast, there are rocks even with, or very near the surface of the water, over which the waves of

the Atlantic ocean often break with fearful violence, and the rapidity of the currents, which invariably set in towards the land, too often have driven vessels ashore here.

We see these people here, their camels, horses and other beasts living together with men, women and children indiscriminately, and they are almost continually at war with their neighbors, which originates in family quarrels. Plunder keeps them incessantly in motion, and they traverse the desert of Sahara to Soudan, Timbuctoo and Wangara, with as little preparation as we should make to go from New York to Philadelphia. This people, living in independence, indulge in dress and use many European commodities which on opening the coasting trade would rapidly expand to great importance in kind and in variety, as they are ready to adopt the use of foreign articles of manufacture.

They raise in abundance gums of various description, almonds, wax, wool, skins and ostrich feathers. There is the desert horse, "shrub-el-rrah" (wind-bibber or drinker of the wind). This horse is fed only on camel's milk and is principally used for hunting ostriches, which are run down by it and then captured. About twenty Sahriawâns mounted on these horses follow the foot-marks of the ostriches until they come in sight of the birds, when they rush at full speed, the bird finding her wings an impediment to her progress against the wind, turns towards the horsemen which are coming up one after the other, and after escaping the first or second, is brought down by the third or fourth or some of those that follow.

The Sahriawâns carry double-barreled guns, procured at the French settlement of Senegal, but when after the ostrich they rather trust to their zewata, which is a stick about two feet long and three inches in circumference, taken from the alk-Soudan tree, which produces the Senegal gum, being a hard, close-grained, heavy wood; this they throw with extraordinary dexterity at the legs of the birds, bringing them down invariably. Having cut the throat according to the Mohammedan practice, they pluck off the feathers and divide them, as well as the carcass, into different portions, each man taking his share. The feathers are generally sold to the agents of merchants at Wadnoon or at the fairs or socks.

For the information of merchants, the method of purchasing ostrich feathers in South and Southwest Barbary is as follows. According to custom from time immemorial, a quintal or 100-lb. weight is thus distributed :

75 lb. small black feathers.

25 "  $\left\{ \begin{array}{l} \text{Zumar} \\ \text{Lobar} \\ \text{Long black} \end{array} \right\}$  of each, one third.

The zumar feathers are preferable to long black, and these to lobar. To this quintal of assorted feathers is added 6 lb. 4 oz. of panable or fine feathers, which are divided into the following proportions :

	lbs. ozs.
No. 1. Surplus face feathers, called Ugub, No. 1 .....	2 0
“ 2. Fine face feathers, of which three count for two of No. 1, so that 3 lb. of No. 2 being delivered, count for .....	2 0
“ 3. Face feathers, valued two for one surplus face, so that 4 lb. count for .....	2 0
“ 4. Common face, 3 lb. count for.....	1 0
To each quintal .....	7 4
Surplus .....	<hr/> 0 12

These 12 ounces over the quintal are brought into imaginary pieces or single feathers, thus : 4 surplus face feathers are calculated to one ounce, so that 12 oz. will make 54 feathers.

4½ surplus feathers are calculated 1 oz.

100 surplus feathers are calculated 22½ ozs.

But custom makes 100 feathers count for 22 oz. without the fraction before mentioned.

The foregoing is the mode of purchasing this article of commerce, which requires much practice before the purchaser will be free from imposition.

The competition among the Jews and the almost entire monopolization of this trade by those people has enhanced the value, for by contriving to exclude the Christians as much as possible from this commerce, they are often induced to trade beyond their capital, overstocking the market, making a forced trade, and throwing the

profits which before were reaped by the Europeans into the hands of the natives.

During the year 1879-80 only thirty-three quintals of ostrich feathers passed through the custom house, valued at \$105,750. It is supposed that about two-thirds more have been smuggled out of Morocco, and the amount exchanged to the Spanish coasters calling at the Wadnoon coast is not known. Ostrich feathers are also introduced into Algeria through Oushdah, all from the Wadnoon districts and North Sahara.

From Tamdant to the line between Sus and Wadnoon, as well as in the oasis of the Sahara, the "lukseb" or sugar-cane grows spontaneously; but the natives have lost the art of making sugar, for this cane was largely cultivated in the palmy days of Tamdant, when sugar was extensively manufactured.

It may not be out of place, with regard to the growth of sugar-cane in the South Barbary districts, to insert in this report what appears to me to be the most ancient direct description of the process for obtaining granulated sugar, for their skill in the production of which article the Moors were celebrated in former times. They also introduced the article into Spain, for it is not generally known that sugar has been one of the productions of Spain as well as of Morocco and South Barbary for at least nine hundred years, and that the process of planting canes, grinding them and granulating the juice has been very little improved in Spain, with the exception of the use of new machinery.

In Morocco and South Barbary, as I have already stated, it has been lost, no sugar being manufactured at the present time.

The following is a translation of an Arabic author on agriculture, a Moor, Ben Mohamed Ben Ahmed Ben el Aucum, who wrote about the year 1140. In his direction for the mode of planting the sugar-cane, he quotes the authority of another author of his nation, who is known to have written in the year 1073, called Abu Omar Ben Hajaj. As the fact is interesting, I shall quote a few passages on the subject :

" The canes should be planted in the month of March in a plain sheltered from the Levant or east wind, and near to water; they should be well manured with cow dung, and watered every fourth day till the shoots are one palm in height, when they should be

dug round, manured with the dung of sheep, and watered every eighth day till the month of October. In January, when the canes are ripe, they should be cut into short junks and crushed in the mill. The juice should be boiled in iron cauldrons, and then left to cool till it becomes clarified ; it should then be boiled again till the fourth part only remains, when it should be put into vases of clay of a conical form and placed in the shade to thicken ; afterwards, the sugar must be drawn from the vases and left to cool.

"The canes, after the juice is expressed, are preserved for the use of horses and camels, who eat them greedily, and become fat by feeding on them."

The soil of the district above-mentioned is well adapted for cotton and tobacco (and will grow all the vegetable productions of the Southern States of America) ; but little of it is cultivated. Being a rich sandy soil, the almond-tree grows in great abundance ; in like manner the olive. Oil is manufactured largely by the natives from the olive and from the argan tree, or "eleodendron," peculiar to this country, which grows in all the extent comprised between the 27th and 32d degrees of north latitude, uncultivated in extensive forests of luxuriant verdure. This tree is very little known in Europe, and is unknown in America. It much resembles the walnut tree, and produces a fruit similar to the almond. The seed is covered with a very thin brush, and when the fruit is ripe it shines in the dark like a glow-worm. The natives gather the fruit, and crush the stones, which yield a light yellowish oil which is very much used for cooking in preference to that obtained from the olives. The tree is bushy, and grows to the size of a large spreading oak.

The cork tree is found in almost every forest north and south of the Atlas.

The yellow boxwood is also rather plentiful in these districts where the orange tree thrives. The stick liquorice is so abundant that it is called (ark Sus), the root of Sus.

The date, which here in Sus begins to produce a luxurious fruit, is found in perfection on the confines of the desert.

At Akka and Tatta the palm or date tree is very small, but extremely productive, and although the fruit be not made an article of trade as at Tafilet, it is exquisitely flavored, and possesses vari-

ous qualities. The most esteemed kind is the Butube ; the next is the Buskrie. So soon as trade is opened on this coast the date will figure amongst the first articles of exportation, owing to its abundance and extra quality.

Sus and Wadnoon produce more almonds than all the other provinces of North Africa collectively, but owing to the distance overland to bring this fruit on camels' back to a seaport (Mogador) only 13,973 quintals, valued at \$230,185, was exported in 1880.

Gum amaranth (a red gum useful for varnishes), gum arabic, aurovar gum, Soudan and Senegal gum are first found in these regions; but for similar reasons of a want of settlement on the immediate Atlantic coast, only 6,511 quintals of gum, valued at \$104,350, was with difficulty transported over the Atlas into Morocco and shipped at Mogador in 1880 for the British and French markets. Wax is produced in great abundance, and notwithstanding the high camel freights and long distance, about \$50,000 worth of this article was brought into Morocco and exported to Europe during the same period. Also gum sandrac and gum euphorbium, wild thyme, wormseed, orris-root, orchilla weed, tobacco, keef and coloquintid. Indigo abounds, but its culture is almost abandoned.

Of gold dust only \$35,000 of the amount brought over the Atlas from these provinces was exported to England last year.

Saltpetre of a superior quality, antimony, silver and copper are found here and about Elala and Shtuka. The silver mines in a virgin state are numerous. The resources and productions of this territory can only be well developed and made the source of great commercial speculations, carried to Timbuctoo, Jinnie and those rich central districts, by the establishment of settlements, with wisdom and perseverance, on the most convenient sites for shipping in this extensive coast.

Commerce between this country and the United States was carried on through the port of Mogador in Morocco since the year 1792 ; it was impeded by a dispute between Morocco and America in the year 1804 and 1805, which, however, was amicably adjusted, and the trade resumed in 1806.

Vessels sailing from Salem, Boston and other parts of the United States, with West Indian American produce, called at Mogador and received in return the various articles of South Barbary produce,

and by these means the agents of American merchants established at Mogador were enabled to undersell the British in all West India and American goods, and even in those of the East Indies.

During the early trade of the United States with West Africa, the American brig *Commerce*, Capt. James Riley, was shipwrecked in August, 1815, when the captain and crew were made captives by the Arabs of Wadnoon, and released after much suffering and labor. Since, the American direct trade declined, and at last ended at the beginning of the civil war.

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## PART II.

### AN ACCOUNT OF TIMBUCTOO.

From time immemorial Timbuctoo has been considered as the great emporium of Central Africa, having carried on an extensive and lucrative trade with Barbary and other North African maritime states, from Morocco to Egypt.

This trade of late years has somewhat declined, and has been carried on by means of acabahrs, or accumulated caravans, which cross the desert of Sahara between the months of September and April inclusive. The largest caravan which crosses the desert is the one from Morocco, and proceeds from Teneluf, in the confines of the desert, once a year in the month of October, and consists of about ten thousand camels, of which only twenty per cent. carry merchandise. The rest proceed from Tandeny, in the centre of the desert, where they load with salt.

Besides this, there are many other caravans composed of one or two hundred camels engaged in transporting the various articles of commerce. The effects which they take to Timbuctoo and the Soudan are various kinds of linens, cotton goods, white and blue salanpores, American cloth and long cloth, sugar, tea, glasses, coral beads, amber beads, pearls, shells, silks, brass nails, wool and cotton manufactures of Fez, and Morocco nutmegs, clove and ginger, cowries and a considerable quantity of tobacco, keef and salt.

The produce of Soudan returned by these caravans for the above

articles, consists in gold dust and gold trinkets from Wangara and Jinnie, ivory, ostrich feathers, gum of Senegal, gum arabic, incenses, Soudan blankets, and slaves from Wangara and Housa.

The value of each camel-load is estimated at \$250, consequently the value of the merchandise transported annually from Morocco by the great akabahr may be estimated at \$500,000 and at \$150,000 that of the small caravans, amounting to \$650,000, the total value of the merchandise conveyed to Timbuctoo. Of this sum seventy-five per cent. belongs to the camel drivers of Sus, who transport salt from Tandeny to Timbuctoo, and twenty per cent. of the camels are sold at this place, as the return goods being light, they require a much less number of camels to perform their traverse journey to Morocco.

The great akabahr is dissolved at Timbuctoo, the merchants returning in distinct groups and by various routes.

At present there are four frequent routes from Timbuctoo to Wadnoon, which are:

- 1st. By Tisity and Wallatta.
- 2d. By Hammada, Teneluf, Tzidy, Tandeny and Arawan.
- 3d. By the Boryle in the Ulad-Bu Oxra, Awin, Tirkis, Aits, Uxa and Wallatta.
- 4th. By Amayett, Teeky, Ulad, Ulad Tedlary, Ulad Dlinsa, Tiris, Waddy, Yedama and Wallatta.

According to information from merchants and from Ali el Saharawi, the oldest desert guide, the itinerary in going with the Begowy (desert camels) is as follows:

From Wadnoon to Tiris.....	12 days
"    Nammandy to Yedama .....	4 "
"    Yedama to Wallatta.....	4 "
"    Wallatta to Timbuctoo .....	10 "
	30 days

With the ordinary camels from sixty to ninety days are employed in crossing the desert.

The tribes inhabiting the territory between the river Draa and the Tiris are independent and warlike, and they will oppose the access of Europeans into the interior of their country. The authority of the sons of Sheik Ben Beiruk only reaches to the Tiris.

The country extending from Wad Draa (river Draa) to Sackia el Hamra is very fertile; from here to Cape Bogador it is composed of sandhills, and from this cape it descends to an immense plain called El Yuff, extending some five hundred miles, which with desert camels they traverse in twelve days. This plain is one hundred and twenty miles in width.

The boundaries of El Yuff are inhabited during four months of the year, in the spring, when the Arabs take their cattle to pasture towards the Gralatz, on these grounds fertilized by the rains of winter. The amaranth or gum arabic plant is found on the plains of El Yuff.

The tribes which encamp on the El Yuff during the spring are those from Dibushaty, Ulad-Ahal-Atzmanu, Taganet, Ahal-Brik-Allah, Zoowich, and from the West Ahal-el Hodh, Ulad Dleim, Arusin and Ulad Zawari.

The three great tribes of the desert are the Arab Hassan, El Zonaya, and El Lahma. The El Zonaya is a quiet and peaceable tribe, the El Lahma is warlike and rich, and the Arab Hassan is a tribe of dreadful reputation, living off the plunder of the caravans which they continually attack.

The ostrich, antelope and gazelle make their appearance on the plains of the Yuff soon after the accumulated rains of winter are absorbed. During this season the most valued ostrich feathers are gathered.

Fresh water is found near the surface of the ground from El Yuff to Yedama, from Yedama to Wallatta the water found is salt, and from Wallatta to Timbuctoo the water is again potable near the surface.

It is asserted by those who have crossed the desert during the last forty years, that the great fatigues and mortality of the transit have lately very much diminished. The Arabs attribute this improvement to the free use of tea, which of late has been introduced in all the caravans. They also maintain that the travelling conditions of the desert are much improved, the water in the skins lasting longer, as for some unknown reason the hot winds denominated "shume" are not so violent as in former periods.

In 1815, a caravan, proceeding from Timbuctoo to Tafilet, encountered the terrible hot winds, so violent that the water in their

skins was exhaled. Disappointed in not finding water at one of the usual watering-places, horrible to relate, the whole of the persons belonging to it, 3,500 in number, besides 2,000 camels, perished of thirst! Calamities of this sort account for the vast quantities of human and other bones which are found mingled together in various parts of the desert.

The intense heat of the sun, aided by the vehement and parching wind driving the loose sand along the boundless plains, gives to the desert the appearance of a sea, the drifting sands resembling the ocean waves; hence aptly denominated by the Arabs (El Bahar bella maa) a sea without water.

In their tiresome journey, the akabahrs do not proceed in a direct line across the trackless desert to their destination, but turn occasionally eastward or westward, according to the situation of certain fertile, inhabited and cultivated spots, interspersed in various parts of Sahara, like islands in the ocean, called by the Arabs El walis (oasis). These serve as watering places, as well as to refresh and replenish the hardy and patient camel. The akabahrs rest on these oasis several days.

The akabahrs cross the desert under [convoy, the "stata" being two or more Arabs belonging to the tribe through whose territory the caravan passes. Thus, in passing the territory of Ulad-el-Hodh-Abbusebah, they are accompanied by two sebayhees or people of that country, who on reaching the confines of the territory of Ulad Deleim, receive a remuneration, and return, delivering them to the protection of two chiefs of Woled Deleim, these again conducting them to the confines of the territory of the Moraffra Arabs, to whose care they deliver them, and so on, till they reach Timbuctoo. Any assault made against the akabahr during this journey while in charge of the stata aforesaid, is considered an insult to the whole clan to which the stata or convoy belongs, and for which they never fail to take ample revenge.

Besides these grand accumulated caravans, there are other flying caravans which cross the desert in much less time; they take with them a sufficient number of female camels (Niag), to supply them with food, they living altogether on the milk of that animal.

It is not ascertained when the communication between Barbary and Soudan was first opened, yet it is certain that the enterprising

expedition of Muley Arsheede, Emperor of Morocco, in 1670, encouraged the exchange of commodities and caused the establishment of the company of Morocco merchants from Fez, as well as that of their factory at Timbuctoo, which continued to increase and flourish until of late, when it declined.

Sid Ali, on his flight from Muley Arsheede, after obtaining permission from the negro king of Bambara, settled with his numerous followers at Timbuctoo and established a Moorish garrison, until the death of Muley Arsheede, when he returned to Barbary. Muley Ismael, Emperor of Morocco, established his power in Timbuctoo, and met with no opposition in putting that place under contribution. Having sent fresh troops to occupy the Moorish garrison there, the inhabitants were glad to make a contribution in exchange for the protection and power which it afforded them, for, previous to this, they had been subject to continual depredations from the Arabs of the adjacent country, to whom they paid tribute as a security to their caravans, which were constantly passing the country of these Arabs, who are of the race of Brabeeshe.

In the year 1727, Muley Ismael died. After his decease the tribute was not regularly transmitted, and his successors, having no means of exacting it, it was entirely discontinued to this day. The Moorish garrison, too, intermarrying with the natives and dispersing themselves about the vicinage, has given to the latter that tincture of Mussulman manners which they are known to possess, their descendants forming at this period a considerable portion of the population of Timbuctoo.

The city of Timbuctoo, at present in much decline and less populous, is situated on a plain surrounded by sandy eminences, about twelve miles north of the Nile el Abeede (River Niger) and three days' journey from the confines of the Sahara ; the city is about twelve miles in circumference, but without walls.

The town of Kabra, situated on the banks of the river, was its great commercial depot or port. By means of a water carriage east and west of Kabra, great facility is given to the trade of Timbuctoo, from whence the various articles of European as well as Barbary manufactures brought by the akabahr from the North of Africa (now in less quantities than before) are distributed to the

different kingdoms and states of Soudan and the south. This great mart is resorted to by all nations of Central Africa, whither they bring the various products of their respective countries to barter for the European and Barbary manufactures.

The main circulating medium at Timbuctoo is (tibber) gold dust.

The houses of Timbuctoo have for the most part no upper apartments. They are rather spacious and of a square form, with an opening on the centre, towards which the doors open ; they have no windows, but the doors are lofty. Contiguous to the entrance door is a building consisting of two rooms, called a duaria, in which visitors are received and entertained, so that they see nothing of the women. The men are excessively jealous of their wives.

The kings, since the death of Muley Ismael, are the sovereigns of Bambara. The name of the present potentate is Said Ben Woolo; he is black and a native of Jinnie, his usual place of residence, though he has three palaces in Timbuctoo.

Many of the civil appointments at Timbuctoo, since the decline of the authority of the Emperor of Morocco, have been filled by Moors of Maroquin origin, but the military appointments have been entirely among negroes of Bambara. The inhabitants are also for the most part negroes, possessing much of the Arab hospitality, and pride themselves in being attentive to strangers.

The various costumes exhibited in the market-places and streets indicate the variety and extent of the commercial intercourse with the different nations of Central Africa.

The religious toleration in this country is complete. Every one is allowed to worship without restraint, according to the religion of his father.

The police of this extraordinary place is extolled as surpassing anything of the kind in North Africa. Robberies and housebreaking are unknown.

The government of the city is entrusted to a Diwan of twelve Alemma, or men learned in the Koran, and an umpire, who retain their appointments, which they receive from the King of Bambara, three years.

The civil jurisprudence is directed by a Cadi, who decides all

judicial proceedings according to the laws of the Koran; and has twelve talebs or attorneys in attendance.

Until the year 1804 no Jews were permitted to enter the town, owing to the extreme jealousy of the individuals of the Moorish factory, whose avarice induced them to exclude every person from sharing their emoluments.

The climate of Timbuctoo is much extolled as being salubrious and extremely invigorating. Men at the age of eighteen have their wives and concubines. It is a disgrace for a man who has reached the age of puberty to be unmarried.

The accommodations for travellers at Timbuctoo are very simple; camels, horses, drivers and merchants rendezvous at a large house, having an open space in the middle round which are built rooms sufficiently large for a bed and low table. These inns are called Fondaks, and each merchant hires a room or more, until he has exchanged his merchandise for Soudanic produce, which he endeavors to accomplish by autumn, in order to be ready for the akabahrs, either to proceed to Morocco, Cairo, Jeddah or elsewhere.

The soil about Timbuctoo is generally fertile, and near the river produces rice, millet, Indian corn and other grain; wheat and barley grow on the plains. Coffee grows wild here, as does also indigo, which they use in their various cotton manufactures. Honey and wax are abundant, but neither are transported across the desert; the natives use the former for food and latter for candles.

There is a supply of fish from the river about Kabra.

The gold mines, which lie south of the river, belong to the king, and are worked by Bambareen negroes. These mines are reported to be extremely rich.

In a country like this, as the Africans are ignorant of geography or any other science, it is very difficult to attempt to give the exact geographical bearing and distance of places from Timbuctoo; but from the several accounts at different times received from respectable people who have resided at Timbuctoo and travelled across Africa, according to their journeys at the usual rate of  $3\frac{1}{2}$  miles per hour, it appears to be situated 1,500 miles S.S.E. of Fez; 1,100 miles about S.S.E. of Akka, Tatta and Wadnoon; 1,300 miles in nearly

the same direction from Morocco; 1,300 miles from Tafilet. It is also about 230 miles eastward of the City of Jinnie, and 1,000 miles east of Houssa.

Dr. Oscar Lenz, the distinguished German traveller, who is now at Tangier on his return from his remarkable journey from Morocco to Timbuctoo and Senegal, obtained through his Minister at this place letters of recommendation from the Emperor of Morocco which were of the greatest service to him on his perilous journey, which he undertook under the patronage of the Berlin societies. Starting from Tetuan, he visited the cities of Fez, Mequinez and other cities of Morocco. He crossed the desert of Sahara as a Turkish physician, Hakem Omar Ben-Ali, under the personal escort of Sheik Ali, in forty-three days, with seven other companions and nine camels, and reached Timbuctoo, where he was treated with great distinction, and which place he reports having lost some of its importance as a market, and, from his hurried observation, the place appeared thinly peopled, now scarcely containing more than 20,000 inhabitants (Hadj-Ali estimates the population at 50,000), and many of its houses in ruins.

Dr. Lenz took three months to reach St. Louis, Senegal. The temperature rarely rose, even in the hot season, above 36 degrees Celsius.

Toward the end of his fatiguing journey, he was menaced by one of the tribes, but was saved by his interpreter's tact. He found in several oases, points which may be of great utility for the Sahara Railway, which French expeditions are preparing by military surveys from Senegal and Algeria simultaneously.

Mr. Gallieni has been exploring the basin of the Senegal from the sea coast of Ségon. Mr. Gallieni reports that a fresh map of the country lying between the Senegal and the Niger will have to be drawn, as the one now in use is altogether misleading. The watershed of the two basins is near Bamakon, only a few miles from the Niger, and at some points the line of separation is so vague that during the rainy season the water sometimes drains into the Senegal and at other times into the Niger; this being the reason why the natives maintain that the two rivers are connected

during the winter. As the basin of the Niger is only a few miles wide, the tributary streams indicated on the maps cannot empty themselves into that river, all of them finding their way into the Senegal. Mr. Gallieni and his companions have obtained some interesting information concerning the Bouré, which has long enjoyed the reputation of possessing great mineral wealth ; and it appears that this district comprises ten villages, with six thousand inhabitants, one thousand of whom are occupied in gold mining, the value of the quantity extracted in their primitive way in a year being about \$150,000. Although the mission was attacked at Dio, Mr. Gallieni reports very favorably as to the attitude of the natives through whose territory the railway from the Senegal is intended to run, and says they are well disposed toward France.

From the mountain chain of Morocco to Timbuctoo the desert of Sahara forms one vast horizontal plateau, and is not broken up into depressions of ground, as was generally believed ; this plateau continuing beyond Timbuctoo and skirting the left bank of the Niger.

On account of Morocco, the Spaniards watch anxiously the progress of the French in the Sahara.